THE AMERICAN ARCHITECT AND BUILDING NEWS



VOLUME XVIII

JULY–DECEMBER

1885

TICKNOR & CO. PUBLISHERS.

211 TREMONT ST. BOSTON.

HELIOTYPE — L.S. IPSEN DEL.

The American Architect and Building News

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII — Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. — NO. 497.

JULY 4, 1885.

Entered at the Post-Office at Boston as second-class matter.

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NOTES AND CLIPPINGS. 10

MR. JOHN R. NIERNSÉE, one of the oldest and most respected architects in the United States, died in Columbia, South Carolina, on the 7th of June. Mr. Niernsée was born and educated in Vienna, but came to this country when a young man, bringing with him the well-trained mind which German technical education gives. Engineers of high theoretical attainments were not so common here forty years ago as they are now, and he soon found employment under the United States Government in the survey of the coast of Georgia and Florida, and, later, in the construction of various important fortifications on the Southern coast. Returning from these duties, he settled in Baltimore, where he was employed by the Baltimore & Ohio Railroad Company, and gained at the same time some note as an architect. A few years before the war, he was selected as the architect of the new State-House which the State of South Carolina had determined to erect, and removed to Columbia, to devote himself to the work. The building was still unfinished when the war broke out, interrupting building operations completely; and he returned to Baltimore, where he continued to practise his profession quietly, but with ever-increasing success. In 1873, on the occasion of the great Industrial Exposition in Vienna, he was chosen as the United States Commissioner to the Exposition, and revisited in that capacity the home of his early years. A few years later, he was selected by the trustees of the Johns Hopkins bequest as consulting architect in the construction of their noble hospital buildings, and continued to act in that capacity until called South by the Government of South Carolina, which had determined to resume the construction of its State-House, and requested its former architect to assume again the direction of the work so unhappily interrupted. Although nearly twenty-five years had passed since he laid down his pencil in Columbia, Mr. Niernsée gladly accepted the invitation to complete the most important of his works according to his original intention, and removed again to Columbia, but he had hardly entered upon his duties before he was attacked with an illness which soon proved fatal. In private life Mr. Niernsée was one of the most amiable and honorable of men, devoted to his profession and zealous for the interests of its members. He was one of the earliest members of the American Institute of Architects, and did much to gain for it the reputation and authority of which his successors now enjoy the benefit.

A PROPOSITION has been made to extend the membership of the National Academy of Design so as to include a certain number of architects, who would be elected to the two grades of associate and full members, just as architects of distinction are admitted to the Royal Academy in England, or the Institute of France. Whether the proposition is likely to be carried into effect we do not know, but it seems to us that such a change in the constitution of the Academy might be productive of good, both to architects and to the painters and sculptors who now alone enjoy active membership, although several architects have been elected honorary members. It is much to be desired that architects and other artists should be brought more together in this country, and every movement for bringing about more intimate relations will be warmly promoted by those who best understand the advantages to be gained in this way. Most architects who interest themselves in the successes of their professional brethren have probably observed that the highest reputation has almost always come to men who, either from inclination or through the habits acquired abroad, have sought the acquaintance and coöperation in their work of the best artists. Whether the painters and sculptors in these cases have gained fame by reflection from that of their friend the architect, or whether he has borrowed plumes from them, is of less importance than the fact that the joint work of two or three men of different artistic professions working together has in several conspicuous instances gained for each a good deal more reputation than either could have acquired by the same amount of labor independent of the other. Something of this effect may perhaps be due to the novelty of the combination, but much ought also to be attributed to the influence of each in criticising and inspiring the other, and to the redoubled power which two artists, enforcing at once the same sentiments by different modes of expression, can give to the design on which they work together. It is true that the simple election of a man as a National Academician would not imbue him with artistic feeling, or secure to him always the coöperation of his brother Academicians in his work; but it would do something to interest him in other artists, and them in him, while the admission of architectural drawings to the annual exhibitions would do still more, and the social intercourse which it is intended to promote in the Academy by regular meetings of the members would perhaps do most of all; and the mutual acquaintance of persons of tastes so similar could not fail to be in some way pleasant and serviceable to all.

THE Society of Architecture of Lyons, as our readers will remember, holds each year a competition, open to all architects, upon a given programme, offering as prizes medals of gold and silver. The programme for the present year proposes a design for a law-school. The building is supposed to be situated in a lot bounded by four streets, and to be set back on all sides from the street line; the intervening space being planted with shrubbery. The plan must include a large *salle des Pas Perdus*, or waiting-room, after the French manner, from which must open three court-rooms. One of these court-rooms is to be devoted to public exhibitions and distributions of prizes, and must be large enough to accommodate three hundred spectators, besides all the professors and dignitaries, who are to have a platform to themselves. The two other court-rooms must hold one hundred and fifty persons each, and each is to be provided with a seat for the judge. Besides these, six lecture-rooms must be provided, each having an area of about one hundred square metres, and a library, to contain twenty-five thousand volumes, with one or two general reading-rooms, to accommodate fifty readers in all, and a special reading-room for the professors, and offices for the librarian and his assistant. Each of the twenty professors is also to have a room to himself; and a general meeting-room for all the instructors, with a dressing-room and ante-room, must be provided, besides an office and ante-room for the dean, and a suite of at least ten rooms for the habitation of the dean and his family. The secretary must also have a lodging, consisting of five rooms, and the janitor and his assistant must each have rooms. Five drawings are required, all at a small scale. The plans of the first and second story only are called for, at one two-hundredth the full size, or about one-sixteenth of an inch to the foot, with the principal elevation and a longitudinal section at double this scale, and a detail, either of the façade or the section, at one-twentieth the full size. The drawings are to be delivered to the Secretary of the Society of Architecture, at the Palace of Fine Arts in Lyons, on or before the sixth day of December next, and the designs will first be examined by a committee of seven members of the Society, who will present a report upon them; and the prizes are finally to be awarded by the vote of the whole Society. We hardly suppose that any of our readers are likely to enter a contest so remote, but it will do no harm to suggest to the younger ones, particularly those who have the necessary leisure, that there is no more valuable exercise than an occasional effort, carried out to reasonable success, at solving an extensive, but well-studied

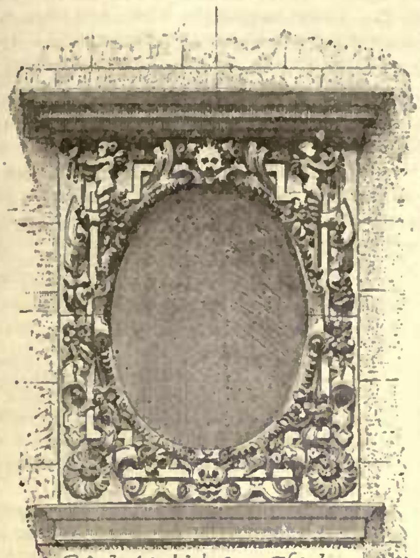
programme like this. An architect who is not sometimes called upon to design large and monumental buildings loses the capacity for thinking architecturally in a monumental way which he ought to have acquired in his student days, and as this is one of the most valuable faculties which an architect of mature years can possess, it is only prudent for those in the earlier stages of their career to try to keep their knowledge fresh by setting themselves occasionally imaginary programmes of a sort more ambitious than those which their business at that period is likely to bring them.

OUR readers will remember the case of the enterprising London builder, who set up a private cemetery at Bethnal Green, and after making a good income for many years by the sale of permits to inter bodies in it, finally completed his speculation, by cutting up the ground into building lots. A great deal of comment was made on the case by persons interested in sanitary matters, who remembered, among other things, that the bodies of many victims of cholera were buried there, and feared the consequences either of disinterring them or of building houses over them, and, as it seems, one result of the agitation was to deter a builder, who had contracted to erect houses on the land on a building lease, from carrying out his agreement. After the facts had been made public, an Act of Parliament was passed, forbidding the construction of any building on a disused burial-ground, and the contractor was thus cut off entirely from fulfilling his promise. The owner of the land, however, professing to believe that this did not affect his right to claim rent for the land, brought suit not long ago to recover about two years' arrears of the ground-rent specified in the contract. In point of law there would be, perhaps, a question whether the neglect of the builder for a year and a half to do what he had promised to do, and might at that time have done, did not give the owner some claim to be reimbursed for the loss which he had suffered through the failure of the other party to the contract to do what he had agreed, before he was prevented from doing so by the Act; but the judge, with that airy wisdom so characteristic of English magistrates, disposed of this argument in a moment, announcing that in his opinion the contract between the owner and the builder involved a violation of the rights of those who had paid money on the faith that their friends and relations should lie in this ground undisturbed; and although there was no evidence whatever that anybody had paid any money on this faith, he proceeded to infer from his supposition that the contract in question "amounted to a conspiracy," and was, therefore, illegal. On this ground, therefore, he rendered judgment for the defendant. The question as to who should pay the costs was disposed of by a process of reasoning about as admirable as the preceding one, his lordship remarking that "there were no merits in the case, and it was an unholy proceeding altogether," and ordering accordingly that each party should pay his own costs.

THE *Builder* quotes from a book by Colonel Parnell, who has recently made himself conspicuous in discussions on the effects of lightning, a table compiled from the recorded observations of the last one hundred and fifty years, showing the kinds of material most likely to be affected by a lightning stroke, and indicating in this way the character of the action of lightning. Colonel Parnell's opinion is that lightning, far from being a stream of fire descending from the sky, is, as he says, an electric explosion, resembling that of a torpedo, and acting in the majority of cases upward, from the ground to the clouds. The action of the stroke is primarily mechanical, and in most cases nothing but mechanical effects are observed, although a part of the force may be converted into heat, just as happens occasionally with any other sort of motion. The table given in the book certainly confirms these views. It is found, for instance, that the material most frequently disturbed by lightning is stone, in the form of rock or of masonry. We are apt to suppose that trees are the most common object of the attack of lightning, but it appears that rocks or stone walls are affected six times as frequently as trees, and, in fact, trees suffer one-half as often as animals or men. When trees are struck, the effect upon them is in about fourteen cases out of fifteen to split or tear them, without burning them at all. In the fifteenth instance the wood is scorched. When men or animals are struck, on the contrary, indications of burning are observed in about three-fifths of the cases. Stone walls or ledges show signs of burning or melting only once in every two hundred cases. Metal is melted much more frequently, this effect being produced almost as often as the purely mechanical effects of breaking or bending. Gunpowder is usually exploded when struck, but this is probably a mechanical rather than a chemical effect, since any sharp shock, as a blow with a hammer, for instance, may have the same result. Gas, however, is also ignited by lightning, either directly, or, more probably as a consequence of the heating of some imperfectly-conducting substance in contact with the gas. It is singular that the bare ground is disturbed by lightning almost as often as trees. We have heard of a lightning stroke which ploughed up nearly an acre of ground in an instant; and it seems that some such mechanical effect as this upon the soil often accompanies thunder-storms.

LE GENIE CIVIL gives an illustrated account of the new Parson steam-engine, or "steam-turbine," as it is called. Strictly speaking, it has no right to this name, since the action of the steam in it is totally different from that of water upon a turbine wheel, but the fact that all the working parts revolve together inside a stationary casing gives its movement a distant resemblance to that of a horizontal water-wheel. Independent of its name, however, it is a very interesting machine. Perhaps the most accurate way of describing it would be to call it an oscillating engine with four cylinders, fixed on the inside of a pivoted drum-like case, and so connected as to cause the drum which carries them to revolve about the shaft by the movement of the pistons. The transformation of the reciprocal motion of the pistons into a smooth rotary movement of the cylinders is effected by an ingenious application of the geometrical theorem that the line described by any point on the circumference of a circle rolling on the inside of the circumference of a circle of a diameter twice as great, is a straight line, coinciding with a diameter of the larger circle; and that a second point on the circumference of the small circle, directly opposite the first, will in rolling describe a diameter of the large circle at right angles with that described by the first. Reversing these conditions, if any number of opposite and alternating forces are applied at opposite points on the circumference of a disk or shaft free to turn, but not to move laterally, their combined action, which, if the absolute direction of the forces were fixed, would result in nothing but cross strains on the shaft, may, by allowing the absolute direction of the forces to change in one plane, that is, by making the cylinders free to revolve, be so modified as to cause the shaft to move with a rolling motion upon the inside of a real or imaginary circumference of twice its own diameter, while the cylinders revolve with a uniform circular movement around a centre which is also the centre of the circle within which the shaft rolls. In practice, the pistons of the four cylinders used are simply applied to a crank, so designed that the diameter of the circumference described by its outside line is twice its own diameter; and as the small circles must turn twice in rolling once around the large one, the cylinders in the engine revolve for every two trips of the pistons. Such applications of pure geometry to practical mechanism do not always prove so successful as the theory promises, but in this instance the crank and pistons seem to follow the courses marked out for them by mathematics with the utmost docility, and the engine can be run at a speed far surpassing that of any other now in use; one now on exhibition in London giving without difficulty twelve thousand revolutions of the shaft per minute, or about ten times as many as the swiftest engines hitherto made have attempted to furnish. This frightful rapidity of movement may be better appreciated by considering that a locomotive with eight-foot driving wheels, running with this speed of shaft, would go from New York to San Francisco in about an hour. Of course, no locomotive could endure such a strain upon it, and the Parson engine has so far been employed chiefly for driving dynamo-electric machines, which are attached directly to the shaft, without belts or gearing to multiply the speed. During the construction of the Suakin-Berber railway, which was built mostly at night to avoid the heat of the sun, these machines were used for furnishing electric-light. An engine, with its boiler and dynamo-machine, was set upon a platform car, which carried also portable tripods, thirty feet high, at the top of each of which was placed a Brush electric lamp. The tripods, which were made to shut up like a telescope, were set up about a hundred feet apart, and connected by wires with the dynamo, which could be shifted to any position desired.

ARCHITECTURAL TERRA-COTTA.—II.[1]



Window (œil de bœuf) in Hotel at Riom France (Close of XVI Cen)

If you should visit Perth Amboy, in New Jersey, you would find that pleasant old town picturesquely located on the banks of the Kill-von-Kull, and by following a wagon-load of the buff, or of the rich red clay, after the material is mined from the pits, you would be carried into one of the largest terra-cotta manufactories in the United States. The buildings constituting the factory are very numerous, their upper stories being connected by means of bridges and the whole terminating in a dock, where the finished articles are finally carried for shipment to the various portions of the States.

Piercing the roofs of some of the buildings, and towering for great distances above them, are the tops of enormous terra-cotta kilns, which, when you come to examine them within, have the appearance of tremendous brick bottles, securely bound every few feet in height with great encircling bands of iron. The loads of clay are thrown out and spread over large floors in order to deprive it of its moisture, and after being properly dried, the clay is next conveyed by elevators or otherwise to the pulverizing machine, where it is thoroughly disintegrated. After being thus treated, the clay is next mixed with powdered old terra-cotta, or with ground flint, sand or other vitrifiable substances. The clay, after being properly prepared and mixed, next passes into a machine called a "pug-mill," and into this machine there passes a stream of water sufficient to "pug" the clay, or in other words to impart to the material the desired degree of plasticity, and the operation is materially assisted by the arms or knives attached to the shaft of the pug-mill which cut the clay in every direction and thoroughly mix it, and finally, when the material issues from the bottom of the pug-mill, it possesses the desired consistency or "temper." The clay, after being pugged and slightly dried, is next cut into masses and conveyed into the workshop of the moulder or the studio of the modeller. When single pieces are ordered, the modeller produces his design in clay, which is afterward carefully dried and then fired. If more than one are wanted, as in the case of friezes, strings, tiles, simple cornices and capitals, or other ornaments which run through a large space, or are often repeated upon a building, moulds of the object are taken in plaster, and one of the most interesting spectacles to the visitor to the terra-cotta works is the department where these moulds are made, an operation which requires considerable skill and dexterity. The plaster-of-Paris is usually mixed in a mill similar to a pug-mill, used for tempering the clay, and as the plaster rapidly hardens, and at the same time shrinks so much during the hardening process that a large mould requires to be made in different sections, and, in cases of intricate design, in a great many pieces.

Numerous men and boys flit about the department, swiftly performing the requisite manipulations as they pour the fluid plaster-of-Paris into forms or into moulds which stiffen while they are smoothing it into shape. In cases of designs which have under-cut ornaments the highest skill and experience are requisite, and in such cases, on account of the rapid deterioration of the moulds, it is possible only to obtain a few casts, and such designs are usually cast first in gelatine, which is readily withdrawn from the under-cut portions of the mould, and upon being released readily resumes its proper form, and in this way the moulds are reproduced and kept uniform. By means of the ordinary plaster moulds, the more common ornaments can be indefinitely reproduced, and in cases of continuous moulding it is not an uncommon practice to shape the moulding by passing it, or, rather, expressing it, from a machine constructed similar to an ordinary expressing brick and tile machine. In case the designs are produced by the latter method, a die of the proper shape is attached to the mouth of the machine, and as the tempered clay is forced through it the moulding is performed. In this way crown mouldings for cornices, etc., are cheaply produced of the desired form and thickness, and are afterward divided by wires into the necessary lengths. When the plaster moulds are employed the clay is pressed with the hand into the mould and the objects are afterward finished with the fingers, care being observed to have the object of uniform thickness throughout, otherwise "warping" or twisting from the heat not reaching all the materials equally and simultaneously will be the certain result. For example, when a mould is employed, the clay is not forced into it *en masse*, but the plastic material is deftly pressed only against the sides, the moulder following the varying surfaces of the mould and leaving, as nearly as possible, a uniform thickness of clay in the various parts, and if the design is of such a character that it would not, in its hollow form of undried and unburned clay, retain its shape unimpaired until fired, then braces or "struts" of clay are formed in the interior so as to sustain the design until it passes through the kiln, and also to add increased strength after being burned. The thickness of the clay of course varies with the nature and different purposes for which the objects of terra-cotta are to be employed; but the average thickness is about seven-eighths of an inch; this, however, is exceeded where strength is a requisite.

A uniform thickness of the material is an imperative necessity in all classes of terra-cotta, whether it is to be used for ornamental purposes or simply as building-blocks, this requisite being more readily attainable in the latter case than in the former, as the blocks are simply hollow pieces of terra-cotta, having walls of equal thickness. There is no question of the reliability of the material, even in a hollow form, for sustaining great weight; but in some cases the blocks are required to be placed in such positions that the hollow portions require to be filled with cement or with cement concrete, and in such cases a material should be employed which will not swell in drying. In order to prevent the bursting of the filled pieces, fat cement, so delusive to many, should not be employed, it being much better to use clean sand and a minimum proportion of cement.

Many of the ornaments reproduced from plaster moulds are very pleasing, but the real beauty of terra-cotta lies in the ease with which the plastic material lends itself to the skill of the modeller, who can impart to it his grandest and broadest conceptions, and then have them transformed into a material which is more imperishable than granite; but to do this successfully, the modeller must possess dignity and great sweep of imagination. He must love his work and be absorbed in it, and habituated to executing his ideas in a manner bold and free, or otherwise his productions will be a failure, as the design must necessarily be viewed from a distance, and show a symmetry of proportion entirely unattainable by one who dissipates his force by attention chiefly to minute details; but the grace and harmony of separate proportions should be preserved in that of the finished whole. Different subjects, of course, require different treatment, but if the design be a panel in high relief it should show spirited modelling; and if the subject is foliage, the curves in the leaves should give good shadow; but whatever may be the object, the result should show genuine artistic skill. The importance of sufficient time being allowed for making moulds, models, and drying the moulded or modelled pieces cannot be over-estimated, and there should be less of that too frequent hurry now so common in the execution of orders. The pieces should be dried just sufficiently to give them the right texture, for if they are too damp or "green" they will crack or be crushed during the firing; should they be too dry, they will crack even during drying, and should there be a great variation in the different portions of an article in regard to thickness, or in proportion of moisture, it is extremely liable to be distorted by twisting, owing to unequal contraction, both during drying and while in the kiln. The objects after being removed from the plaster moulds are finished by hand, and should the workman leave portions of the surface unevenly finished, or one part less smooth than the remainder, which not infrequently results from some partial tooling arising from an after-thought after the article is partially dried, the difference in the texture of the surface will prove another source of danger while the article is in the kiln, as it would be very liable to distortion because of the moisture contained in the clay being drawn from the smoother portions and dispelled through the more porous, thereby causing the former to contract. The system of piece-work, which is generally adopted in English and by some American terra-cotta works, is an unmitigated evil, and is not infrequently the cause of much of the cracking, distortion, twisting, warping, or the irregularities which have come to be commonly regarded as inevitable.

There is, of course, good terra-cotta, as well as lower grades of the same material; but architects often have only themselves to blame for the inferior quality of this material, which not infrequently finds its way into buildings, because they allow the control of this branch of the work oftentimes to pass into the hands of irresponsible contractors, who have no interest in the matter beyond the profit which they can make by placing the order. If architects would treat directly with manufacturers of terra-cotta, and give them a reasonable time in which to execute their designs, there would be less complaint on the scores which have been mentioned, and valuable time would in many instances be saved. When the execution of the designs in terra cotta are entrusted to the general contractor, he will naturally seek to have the work executed as cheaply as possible, and as all the better manufacturers of this class of material compete on almost equal terms, the probabilities are that the execution of the architect's designs will in the end fall into the hands of manufacturers who do not possess sufficient facilities and are not over particular in regard to the work which they turn out, or the promises which they make.

There are stones of good quality and others of poor quality, and there are some which are soft and others which are hard, and with terra-cotta it is just the same; some being bad in color, bad in texture, and bad in every other respect, and such material is produced from clay which is wholly unsuitable for the purpose, as the shrinkage

[1] Continued from page 268, No. 49¹.

is uneven and excessive, consequently requiring an undue proportion of "grog" to be mixed with it during the pugging, and which is intended in some degree to obviate the imperfections of the clay, but the common result is that the color, if it be red, is oftentimes completely ruined. In order to give the surface the desired red color, the moulded or modelled terra-cotta, after being dried, is washed over or dipped into a "slip" of clay containing oxide of iron, and after being burned, the object thus treated presents for a short time a good appearance; but after a time, as the wash can never be made to permanently adhere to the terra-cotta body, owing to alternate frost and thaw, atmospheric and other changes, it finally falls off and discloses an undesirable, mottle-colored surface, which permanently disfigures the structure. It may be said in this connection, by some persons, that they can not see any additional reason why the architect should control and hold in his own hands the execution of his designs in terra-cotta, than for any of the other materials which enter into the construction of a building; but, as the architect will be held more rigidly responsible for any failure, artistic or otherwise, in the terra-cotta than in the ordinary materials, we can see no good reason why he should allow it to be executed through the general contractor any more than he would allow the frescoing or other fine decorative features of a building to be performed by that individual.

There are, of course, delays in supplying all materials for a building which require to be produced upon special order, and this is especially true in regard to those which have to be subjected to the action of fire, as there must necessarily result a certain percentage of loss, and it is this which oftentimes causes the annoying delays in supplying terra-cotta. The question naturally arises, how are such delays to be obviated? Undoubtedly the proper way is for an architect, when his client and himself have decided that terra-cotta shall be used in the structure, and the plans and specifications have been fully agreed upon, is to immediately prepare the working details of his designs, and forward them to the manufacturer whom he may select for their execution, and while tenders are being received for the work of constructing the building, and while the excavation is being made, the terra-cotta manufacturer can be turning out his work, so that when the builder is in readiness for the first consignment, it is more than probable that the terra-cotta manufacturer will have the major portion of the work accomplished, and in such cases there would be no procrastination. The delays in receiving terra-cotta, because of which so many complaints arise, are caused in almost every case, by a block — usually some very important constructional one in the building — being destroyed either in the drying or burning, and if the manufacturer could obtain a sufficient lead of the contractor, he would have an opportunity to replace such a block by another, before it would be required in the work. It is, however, not only because of the delays, but also on account of quality, that time is so important to the manufacturer of terra-cotta; for in nine cases out of ten, it is when the work requires to be unduly hurried through the moulding or modelling and the drying and firing, in order to keep the building "going," that the defects of cracking, twisting and warping take place. If this material is properly treated, and allowed sufficient time, it will issue from the kiln as true and as beautiful as if it were carved from stone with the chisel and the mallet.

Manufacturers are sometimes delayed in getting out terra-cotta work by the manner in which the working-drawings are prepared, as few architectural draughtsmen possess the necessary extensive experience requisite to properly prepare such drawings. The form of the pieces, as well as their size, require to be taken into consideration: the manner in which they are bonded and keyed, the joints, etc.

I have dwelt thus long upon the delays which are liable to occur in the execution of architectural designs in terra-cotta, and the manner in which they can be avoided, for the reason that such delays or the apprehension that they will occur often militate seriously against the employment of the material.

After the pieces have been carefully and thoroughly dried, they are carried to the kiln, in which they are skilfully set, the smaller pieces being packed in "seggars," and in delicate pieces of terra-cotta relief work, in order to preserve the sharpness and definition of texture, they are sometimes packed in a less fusible powder, like quartz grain or canister. The entrances to the kilns, after they are filled, are finally walled up with brick, and daubed or plastered over with clay, and fires are then lighted in the furnaces underneath. The kiln used is an up-draught kiln, so constructed that the fire does not come into contact with the object to be burned, the flame passing from the gates, at the base of the kiln, through a pipe set up in the centre. The objects are placed in the kiln in tiers, separated by fire-brick, the larger pieces being placed in the topmost portions of the kiln, and the time and method of burning are about the same as in the case of fire-brick.

When terra-cotta has been improperly fired, there is constant danger that it will rapidly disintegrate after a short season of exposure, owing to the fact that it failed to receive sufficient heat to impart to the perishable clay the chemical change upon which its indestructible character depends. The simplest tests are usually sufficient to distinguish inferior terra-cotta from that of good quality, for a well-burned and enduring material will emit a sharp, metallic, ringing, bell-like sound, when forcibly struck with a piece of steel, which will cause a spark to be emitted; but such a blow will not dent or disfigure the terra-cotta, the only visible mark being such as would be made by a black lead-pencil.

The advantages of this material are its superiority and its cheapness, consequently allowing greater ornamentation to be used in the construction of a building. These advantages become at once manifest, if we recall what a tiresome and expensive piece of work it is to carve a long piece of repeated design in stone, and how comparatively cheap and easy it is to make an elegant, delicate model almost as clear-cut as a cameo, in soft clay or on a plaster-of-Paris slab, take a mould from it, and reproduce from twenty-five to fifty pieces, or as many as may be required, in fact, by simple mechanical labor. How much must an artist lose by conveying his ideas through mallet and chisel, while with a touch of his finger he imparts to the soft, yielding clay the impression of his soul, which, on being properly dried and burned, will last forever. It is an interesting sight to stand in the studios of a modern terra-cotta factory, and witness the work of the artists in this material, who, alert with keen intelligence, stand before large easels supporting masses of clay, carving the bas-reliefs from sketches hanging above them, and many of them seem to truly love their work.

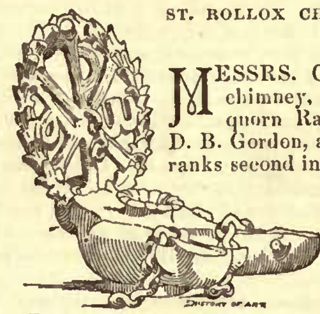
While stone and all other natural productions used for building crumble away by the action of the weather, or crack and twist into all kinds of conceivable shapes under the influence of fire, terra-cotta never changes, and presents the only lasting triumph of man over nature; the material being absolutely indestructible, excepting through sheer wantonness.

Architects are now coming to the conclusion that in the construction of fire-proof buildings there should be employed just as little iron, stone, wood and galvanized-iron as possible, substituting terra-cotta wherever possible, in the place of each of them.

CHARLES T. DAVIS.

TALL CHIMNEY CONSTRUCTION.[1] — II.

ST. ROLLOX CHEMICAL WORKS CHIMNEY, GLASGOW.



Ancient Christian Lamp. From the Vatican.

MESSRS. CHARLES TENANT & CO.'S chimney, projected by the late W. J. Macquorn Rankine, C.B., LL.D., designed by L. D. B. Gordon, and built by the late Mr. McIntyre, ranks second in height, being in

	ft.	in.
Height from foundation to top . .	455	6
" " ground surface to top	436	6
Outside diameter at foundation . .	50	0
" " ground surface	40	0
" " top	13	6

It has an inner cone of the following dimensions: —

	ft.	in.
Height of inner cone from foundation to top..............	263	0
Height of inner cone from ground surface to top	243	0
Inner cone inside diameter at foundation..................	12	0
Inner cone inside diameter at top.........................	13	6

The use of the inner cone is to protect the principal stalk from various kinds of gases.

No piles were driven in the foundation, it being founded on a bed of concrete fifteen feet thick on the top of the rock, the upper surface of the concrete, the better to resist any downward pressure, being finished at right angles to the line of the principal shaft, which inclines inwards for a considerable height.

The outline of the chimney, it may be said, is taken from the Eddystone Lighthouse, or the natural form which a chain would assume in being stretched from a height to a point on the ground beyond that of its upper end.

The late Mr. Peter Wilson, C.E., resident on the Highland Railway, was entrusted by the designer of the chimney to superintend the erection of this important shaft.

The highest chimney-stack in England is the

LARGE CHIMNEY-STACK OF MESSRS. DOBSON & BARLOW, KAY STREET MACHINE-WORKS, BOLTON, LANCASHIRE.

The large chimney-stack connected with seven boilers, ventilating-flues, furnaces, etc., at these works was completed in November, 1842, and was then intended to serve a chemical-works. Shortly after, the ground occupied by the chemical-works was included in Messrs. Dobson & Barlow's works, and consequently the chimney came into their possession.

The following are some principal particulars: —

Total height from ground level, three hundred and sixty-seven feet, six inches.

Octagonal in plan, fourteen feet on every side, or one hundred and twelve feet girth at bottom.

Thickness of brickwork at bottom, eight feet.

Thickness of brickwork at top, one foot, six inches.

Five feet, six inches on every side, or forty-four feet girth at top.

Eight hundred thousand bricks and one hundred and twenty tons of stone-work were consumed in the building. The top with cornices and mouldings required thirty tons of stone and cement.

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[1] A paper by R. M. Bancroft and F. J. Bancroft, read before the Civil and Mechanical Engineers' Society. Continued from No. 493, page 269.

EDINBURGH GAS-WORKS CHIMNEY.

	ft.	in.	
This chimney is	341	6	from foundation to top.
"	329	0	" ground "
Stone foundation	40	6	square, and 6½ft. deep.
" pedestal	71	0	high.
Stone pedestal	30	0	square at ground line.
" "	27	9	" top.
Brick shaft	264	0	high.
" "	26	3	diameter at bottom.
" "	15	0	" top.

The main brick shaft is diminished in five steps of the following successive heights:—

	ft. in.
1st bottom portion	35 by 35
2d portion	41 " 30
3d "	48 " 25
4th "	58 " 20
5th "	84 " 15

An inner chimney of brickwork ninety feet high by thirteen feet.

The next chimney that I shall notice is the one at Barmen — the interest attaching to this is another example of straightening when out of perpendicular.

MESSRS. WESENFIELD & CO.'S CHIMNEY, CHEMICAL FACTORY, BARMEN, PRUSSIA.

This chimney is 345 ft. from foundation to top.
" " 331 " " ground "

The foundation was made of large flat quarry stones with terrace mortar: One lime, one river sand, one terrace, which latter is a kind of puzzolana.

Twenty feet square pedestal, by forty feet high by seven bricks thick.

Octagonal shaft two hundred and ninety-one feet high.

Octagonal shaft, exterior diameter seventeen feet at base by five bricks thick; this diameter is reduced two-and-one-half inches every ten feet, so that at top of shaft it is two bricks thick.

According to the original design, it was intended to only build it two hundred and sixty feet high, but as the building was proceeding in a very satisfactory manner, it was considered safe to increase the height without altering the dimensions of the base; and it has been calculated that in the lowest part of the shaft the brickwork sustained a pressure of twenty-one thousand three hundred and thirty-five pounds per square foot, or one hundred and forty-eight pounds per square inch.

The interest attaching to the chimney is that a few months after completion it got out of the straight, and had to be put right in a similar manner to the "Port Dundas" chimney, described at the beginning of my paper.

The chimney was built with great care, the mortar being prepared every morning — the proportions used for the pedestal being one lime to two of river sand.

Cement mortar was used on rainy days, mixed in the proportions of one cement to two of river sand, and the crown of the chimney of cement exclusively. The joints of the brickwork were flushed up with cement.

The three masons who did the whole work daily changed their positions on the chimney, so as to equalize any unevenness in the masonry that might be caused by imperceptible differences in the manipulations of the different individuals. At distances of fifty feet, single layers of brickwork were painted black outside, to afterward facilitate an estimate of the height of any point of the chimney above ground. The chimney was built from the outside without a scaffold, the materials being hoisted by a steam-engine put up temporarily near the place of construction. The motion was transmitted by three rollers or drums. The frame which supported the upper drum was moved higher up after the completion of every three or four layers of brick, and was, at the same time, turned horizontally from one side of the octagon to the next one, to equalize the effect of the pressure of the frame on the masonry. The holes made into the masonry to support the frame were filled up with brick and mortar immediately after the removal of the frame to a higher level. The construction of the chimney was thus successfully completed in October, 1867, was perfectly vertical, and answered the requirements for which it was erected. But in the spring of 1868, remarkable for vehement and long-continued gales and storms, this chimney suddenly assumed an inclined position toward the northeast. The injurious action of the southwest wind was probably favored by the bold proportions of the structure, by the yet subsisting softness of the mortar, and by the large size and the shape of the ornamented chimney crown. This crown caught the wind, and thereby caused it to act as on a long lever. The chimney was thus bent, and the mortar not being perfectly dry the brickwork did not yet possess the necessary elasticity to return to its original shape.

The deflection of the chimney was considered at the end of May, and seemed yet to increase, and threatened an overthrow.

As before mentioned, some layers of bricks in the chimney at distances of fifty feet from each other were painted black outside. The height of these black lines above the pedestal being known, these lines were, by means of a theodolite, projected on a plank situated on the pedestal of the chimney, to find the deviation from the vertical line at these different heights. It was thus ascertained that the chimney, at a height of

251 ft.	was out of line	45 in.
210 "	" "	30 "
160 "	" "	16 "
110 "	" "	5 "

The pedestal stood perpendicular. As the deviation was still increasing, and as it would have done too serious an injury to the manufacture of the establishment to set the chimney temporarily out of use, it was necessary that immediate action should be taken in the matter. The ordinary method of straightening chimneys was at first resorted to. A hole was made through the whole thickness of the masonry on that side of the chimney which required lowering, at a distance of four feet above the top of the pedestal. Into this hole a saw was introduced with which a horizontal cut through one-half the chimney was attempted. But as the thickness of the wall was considerable and the bricks hard, and as the saw could be manipulated from one of its extremities only, the effect of sawing after two hours' work was scarcely perceptible.

A hole through the chimney having been made without trouble, the difficulty experienced in sawing led to the idea to gradually remove a whole layer of bricks, replacing it by a thinner layer, thus to produce the desired slit. Before, however, this operation was performed, the experiment was made with an old inclined chimney, one hundred and twenty feet high. When the method had there proved practicable and successful, it was concluded to treat the new chimney in the same way.

A layer of bricks was broken out by means of pointed cast-steel bars from one-and-a-half to five feet in length.

Purposely-made flat shovels, with long handles, were used to lay those bricks which had to be placed near the inside of the chimney. A space of five inches was left each time between the newly-laid bricks and the old ones of the next division, to break out the latter with greater facility.

The width of each single division was two feet to two-and-a-half feet. The masonry was sufficiently dry above not to give way when a layer of that width was removed below it.

The act of settling by oscillations lasted from eighteen to thirty-six hours, corresponding to the width of the slit, which was different in the different cuts performed, in a similar way at different heights of the same chimney. The oscillations were the greater and the livelier, the higher up the cut was which produced them.

At the highest cut, one hundred feet from the top, the oscillations were such that the mason became frightened and left the place; the slit became alternately wider and narrower by three-fourths of an inch. The facts before mentioned seem to prove the elasticity of the whole structure. Four cuts were made into this chimney; the

1st	4	feet above the pedestal, greatest width	⅜
2d	100	" " " " "	1¼
3d	140	" " " " "	1½
4th	191	" " " " "	1

After the completion of these operations, the chimney continued during several weeks to settle slightly in the direction opposite to its former inclination, the brickwork on that side being now subjected to a higher pressure than before.

This circumstance had to be carefully considered beforehand, or else the slits would be made too wide, and produce an inclination of the chimney in an opposite direction. A severe storm which occurred on the 6th and 7th of December, 1868, and which threw over several chimneys in the neighborhood, did not affect the above. The result of the straightening operation before described is perfectly satisfactory, and the structure is now stronger and steadier than ever.

I have yet to speak of the means by which the upper parts of the chimney were made accessible to perform the upper cuts. This was done on a new and interesting plan. Standing on the lowest platform, the masons made a number of holes all on the same level, four feet above the platform, into the exterior wall of the chimney. They stuck iron bars into these holes, and fixed boards to them, so as to form another platform. Standing then on the latter, they made another one four feet higher up in the same way, and so forth. Every second platform was again removed, so that the remaining platforms were eight feet apart.

They were then joined by ladders to make the ascent possible and easy. This method is, however, only practicable when the chimney has a considerable diameter, and when the mortar is sufficiently dry not to give way under the one-sided pressure of the bars and platforms which would make the arrangement loose and unsafe.

In December, 1868, another chimney at Duisburg was straightened by the method above described. But as the diameter of the chimney was not as large as that of the Barmen chimney, and as the mortar was yet soft, a wooden scaffold was erected around the chimney, to get at the upper points which required cutting. The breaking out and replacing of the bricks could not be done there in divisions wider than five to ten inches, otherwise the upper masonry, not being dry, would have settled down. When the chimney was straight, a further settling towards the side of the cut was prevented, by driving iron wedges covered with mortar into the slit.

It is needless to add that great care must be used in the method of straightening chimneys here described, for without precaution it may end in a fatal manner, as recorded farther on in a case at Oldham, where, owing to the reckless manner in which it was done, one man lost his life.

Mr. Edwin Nash, in a paper referred to before, cites two other cases of straightening chimneys. There is one near the canal, between London and New Cross, which leaned over soon after it was built, but was brought back to the perpendicular by boring holes in the mortar joints near the base on the contrary side to the lean, and being done with much caution. A large one, in Yorkshire, which had a very great lean and was likely to fall, had part of a course of bricks cut out from the bottom, slowly and carefully, and filling in the cavity as the operation went on with new lime and earth, and when the cut was complete the chimney gradually assumed its perpendicular, squeezing out the lime and earth as it came over.

MESSRS. EDWARD BROOKS & SONS' CHIMNEY, FIRE-CLAY WORKS, HUDDERSFIELD.

The shaft is built entirely of fire-clay.

It is 330 feet high from foundation to top.
315 " " ground "
Concrete foundation.
Ragstone footings 36 feet square at base.
" " 31 " ground.
Brick shaft 27 feet outside diameter at ground.
" " 15 " inside " ground.
" " 12 " outside " top.
" " 9 " inside " top.

The chimney contains the following weights: —

144 cubic yards concrete.
2452 " feet ragstone footings.
3341 " feet ashlar.
2227 " yards brickwork.

The cap being so large, and overhanging so much, has cost the firm at least £700. In the first instance the covering blew down; it was entirely removed and covered flat with lead, which also blew off, and all had to be taken down. Then the action of the acids emitted from the chimney decayed the stone; one of the overlapping stones fell off; Messrs. Brooks then removed all down to E, and rebuilt the top to its original height.

The firm, from their experience, have arrived at the conviction that chimneys should be built with one regular batter from bottom to top, and no stone should be used at top, any overlapping to be gradually formed by hard-burnt radiated fire-bricks fourteen inches by five inches by three inches.

CHIMNEY AT MESSRS. MITCHELL BROTHERS, MANCHESTER ROAD, BRADFORD.

This stone chimney is octagonal.

Height from foundation to top 330 feet
" " ground " 300 feet
Flue perpendicular 7-0 dia.

The foundation consists of

1 course of concrete 22 ft. by 22 ft. by 1 ft.
1 " " 21 ft. by 21 ft. by 1 ft.

The stack itself measures

20 feet across foundation
9 feet at summit.

The architect who designed the shaft was Mr. Mark Brayshaw, and the builders, Messrs. John Moulson and Son.

CIRCULAR CHIMNEY STACK, ADAMS'S SOAP WORKS, SMETHWICK, NEAR BIRMINGHAM.

	ft.	in.
Height from bottom of foundation to top	326	10
Height from ground surface to top . .	312	0
Outside diameter at ground surface . .	27	2
Inside " " " . . .	15	2
Outside " at top	5	6
Inside " "	4	0
Weight of brickwork	2000 tons	
Weight of concrete, sand, and lime . .	150 "	

This chimney was built in 1835, and at the time of its erection it was the highest in the kingdom. The builder who began the work felt alarmed when about half way through his work, and the firm had to finish it themselves.

It has been five times struck by lightning; once during the building, and four times since. No very serious damage was done to it by the electric fluid, but once, when perhaps, from the same cause, and the abstraction of the lime by hydrochloric acid from the mortar, the owner was compelled to take down a portion of the top. A few years ago, about thirty feet more were removed by a Mr. Frith, builder, of Coventry, by means of a kite, without stopping the works. The total height is now about two hundred and fifty feet.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR THE CHAMBER OF COMMERCE, CINCINNATI, O. MR. BRUCE PRICE, ARCHITECT, NEW YORK, N. Y.

THIS building is designed in the spirit of the French Renaissance of the early sixteenth century, when brick and stone and tile were the materials employed. The design embodies the same materials. The old municipal buildings of that period were carried up with great square towers, high, peaked roofs, and long, tapering dormers like the pinnacles of the ecclesiastical structures that preceded them. Upon the walls were sculptured the arms of the guilds and the triumphs of their champions. These motives entered into the spirit of all their details. Heavy mullioned stone windows, reaching from floor to roof, lit their great halls, and enormous fireplaces, with richly-carved canopies, warmed them. In plan and general requirements these city-halls of Northern France and the Low Countries were in many respects analogous with the requirements of the proposed Chamber of Commerce.

The Great Hall, one hundred feet long by seventy-six feet wide, and fifty feet high, is placed to the rear of the second tier, with great windows on two sides of it. On the front is the lesser hall, with bay-windows commanding the corner at Fourth and Vine Streets. This room opens into the Great Hall through broad, high portals, and is virtually a continuation of it. In it are the files of the reports, newspapers, the tickers and everything pertaining to the contemporary operations of commerce. Directly off both halls is the members' lobby, with the grand staircase leading down to the Fourth-street entrance. In this space, broken with columns and the parapet surrounding the stair-well, members can meet for hurried instruction or hasty conference with their friends and clients, the space being so planned and designed by its peculiar features as to give that sort of lobby accommodation always required in such buildings. Apart from these rooms, on the level of the Great Hall, are others set apart for the use of the Chamber of Commerce, which are arranged upon the half-story levels coming in between the floor and ceiling of the Great Hall. These are: first, a visitor's gallery, arranged over the clerks' room and lavatories, and also the gallery story of the lobby (see sections B and C); second, the entre-sol story just over the gallery, which contains two large rooms on Fourth-street front; third, the mezzanine floor, which is eight feet in the clear, coming between the entre-sol and the first office floor of the building. This floor consumes the space in the balance of this level not occupied by the roof of the Great Hall. The mezzanine floor contains five excellent rooms.

Above the level of Great Hall roof are two full stories, with thirteen fine offices in each, and two additional stories in the tower, with five offices in each. The illustrations exhibit the remaining features of the planning.

In elevation the design rises out of this plan in stone and brick, with tiled roofs. The great entrance on Fourth Street is through triple portals; the central one, leading directly to the grand staircase, is arched. The whole of the great entrance, with the lobby above, is treated under one frontispiece, with carving emblematic of commerce and trade, and the name of the building across the lintel. The tower rises on the corner of Fourth and Vine Streets, girdled at the level of the eaves with a sculptured procession of figures of heroic size, in high relief, typifying the arts, sciences, manufactures, commerce and agriculture. Upon the tower and Fourth-street fronts are arc-lights designed as features of the elevations.

Whilst a general *motif* runs through the entire mass, as in the design of the windows and their enrichment, there are certain distinctive features that claim for the building a pronounced public character; notably the tower and its processional frieze, the treatment of the roofs, the entrances, and the general outline of the whole. In detail, the leading features are designed for special treatment; the entrance lobby, grand staircase and members' lobby are designed for marble wainscot, steps and columns, with trabeated ceilings in stucco and tiled floors. The corridors of ground floor and basement to be the same. The Great Hall to be built of cut-stone to the seat of the girders, with oak wainscot to the height of the doors. The roof of Great Hall to have deep panels between the beams, the meeting of the girders treated like pendant beams, and the walls and ceilings of the panels heavily enriched to give the effect of a deeply-timbered roof. The lesser hall to have a high oak wainscot, carved stone chimney-piece, and a trabeated ceiling.

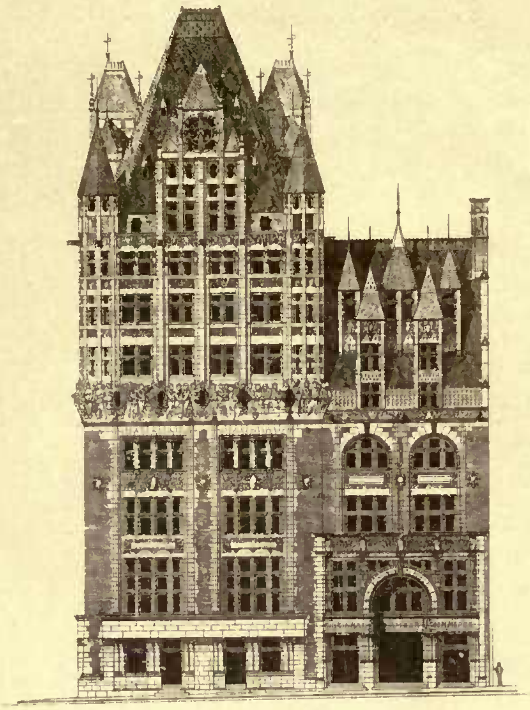
On the sections of the Great Hall certain designs are shown in the pediments of the arches. Those over the gallery are designed for mosaic, and those over the bays for glass-mosaic, but all to be of subjects bearing upon the arts, commerce, etc. The floors of great and lesser halls to be of oak parquetry. Throughout the building the finish to be in quartered antique oak, and the whole structure to be absolutely fire-proof. As to the cost of such a work, that can only be arrived at by comparing it with buildings of a like character erected throughout the country. The design is in no wise an extravagant one, but will compare in finish and detail with such eight and ten story fire-proof structures as the United Bank Building of New York, which cost between thirty dollars and thirty-three dollars per square foot of surface covered. Basing an estimate upon that and a knowledge of prices in Cincinnati, which are considerably less than building prices in New York, there seems no doubt that the building can be erected for the sum of five hundred thousand dollars.

BOSTON TERRA-COTTA COMPANY'S PREMISES, FEDERAL STREET, BOSTON, MASS. MR. W. G. PRESTON, ARCHITECT, BOSTON, MASS.

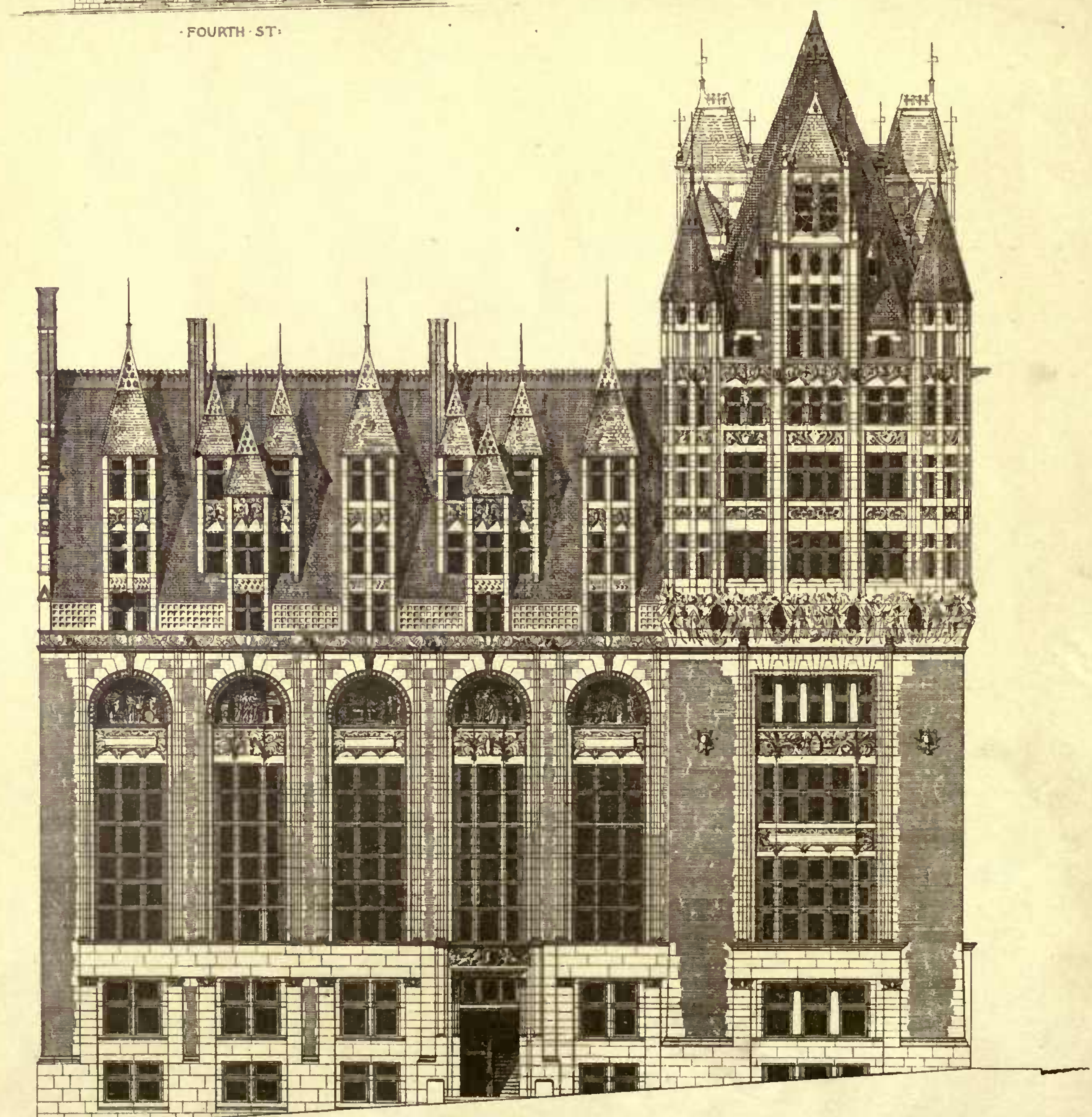
THE extraordinary and well-earned success of the Boston Terra-Cotta Company has necessitated the enlargement of the premises occupied by them on Federal Street. They own a very large and valuable frontage and will eventually cover the whole with buildings for their own use. With a view to future developments and growth



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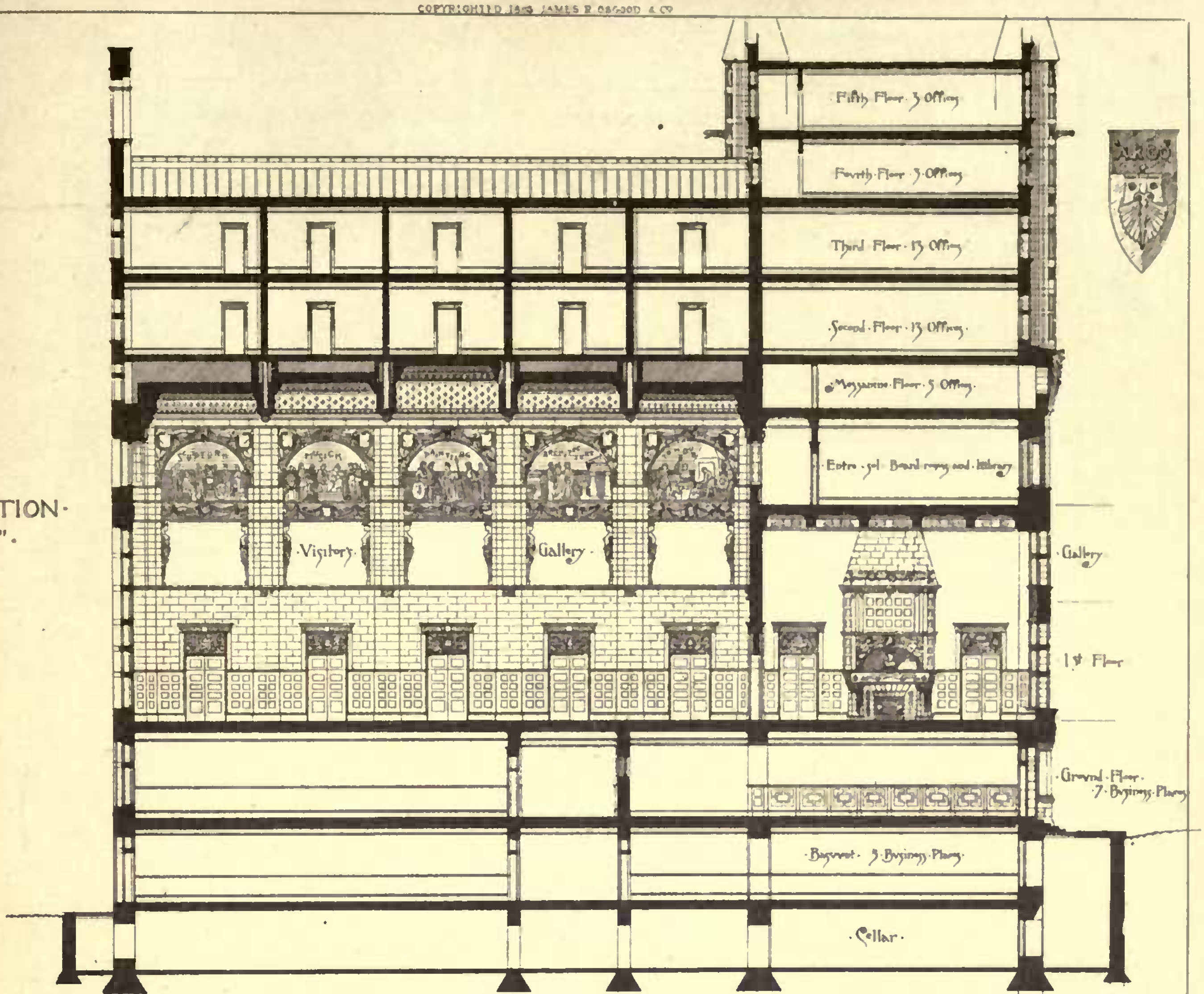
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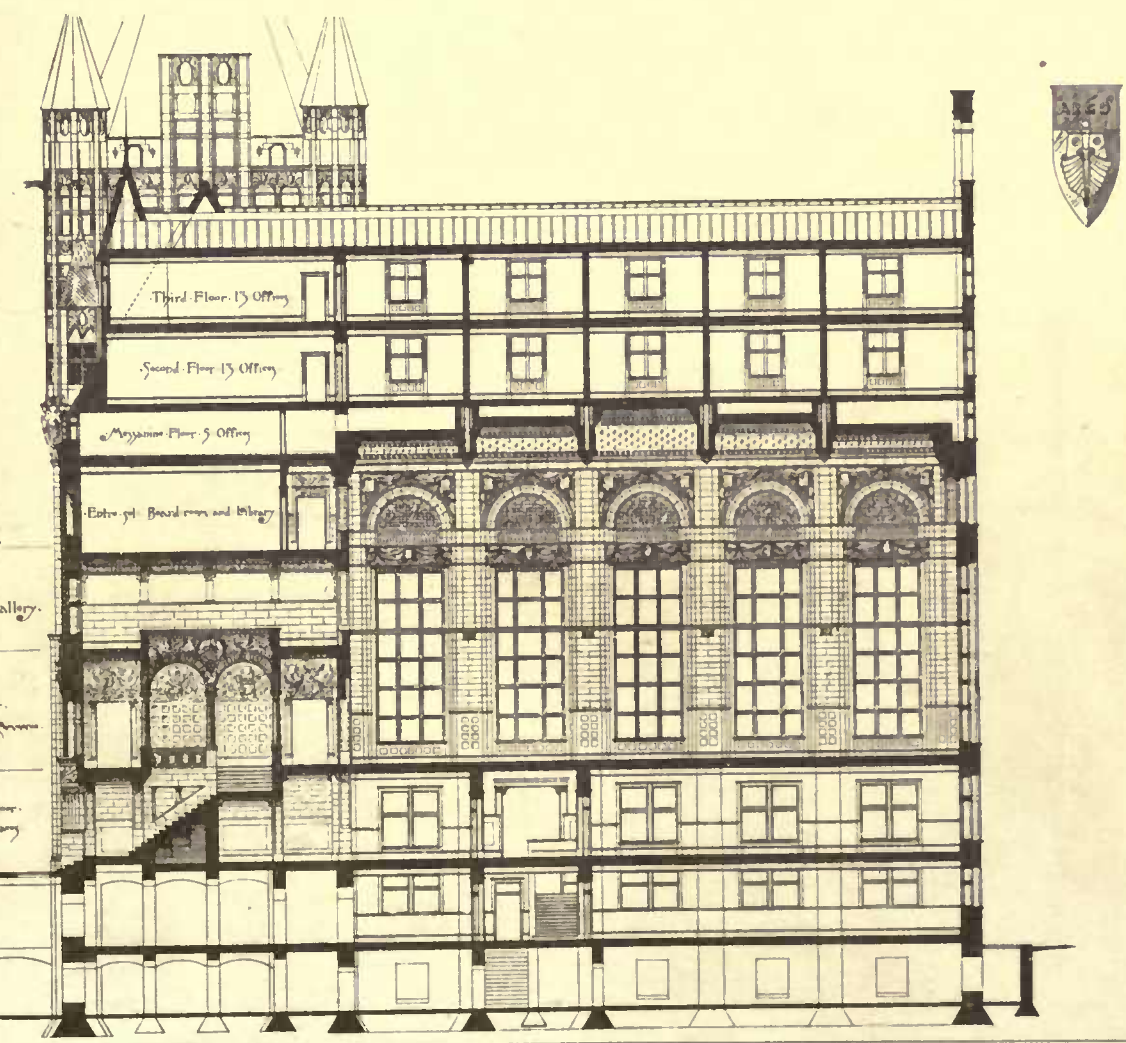


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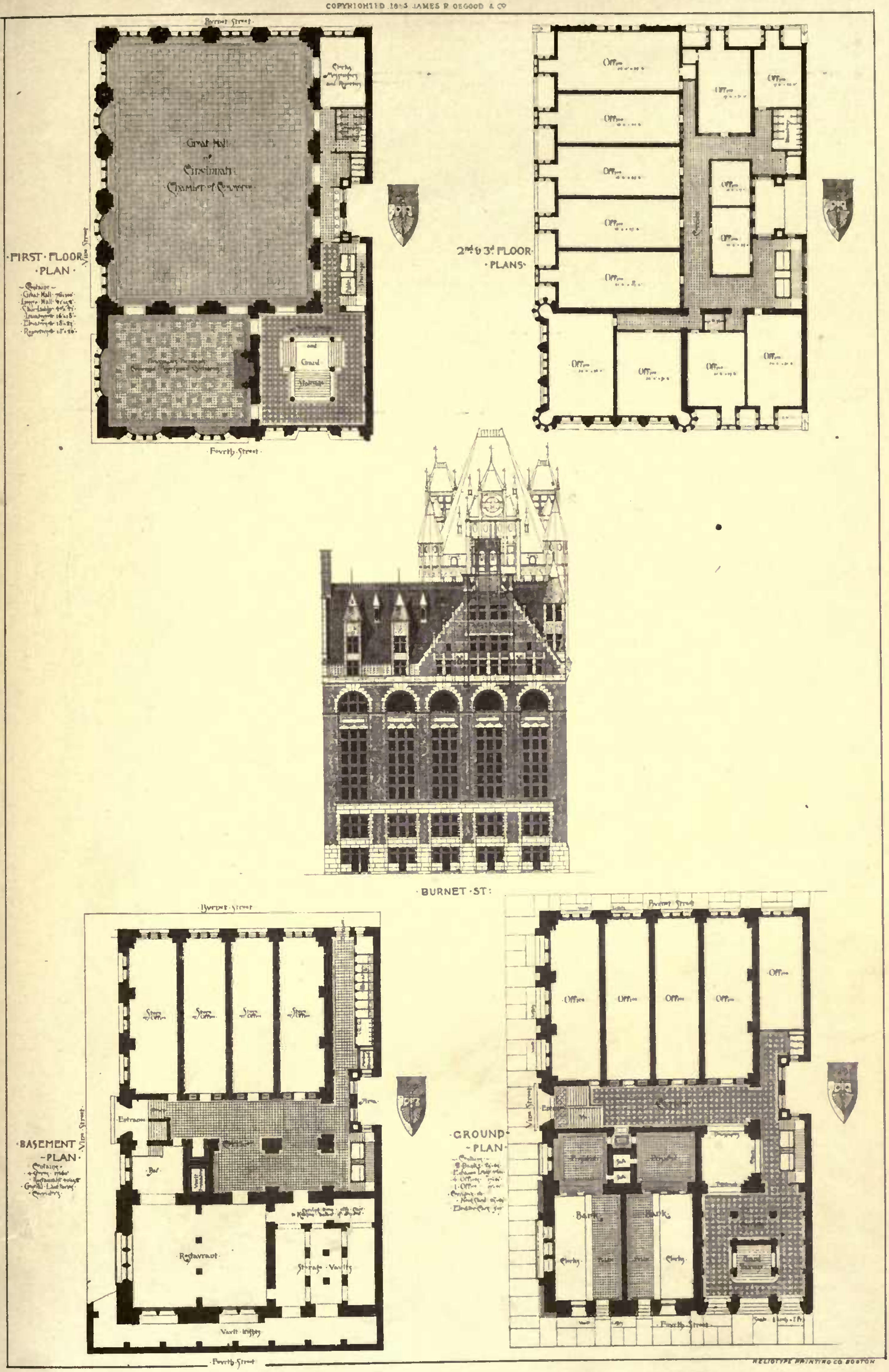


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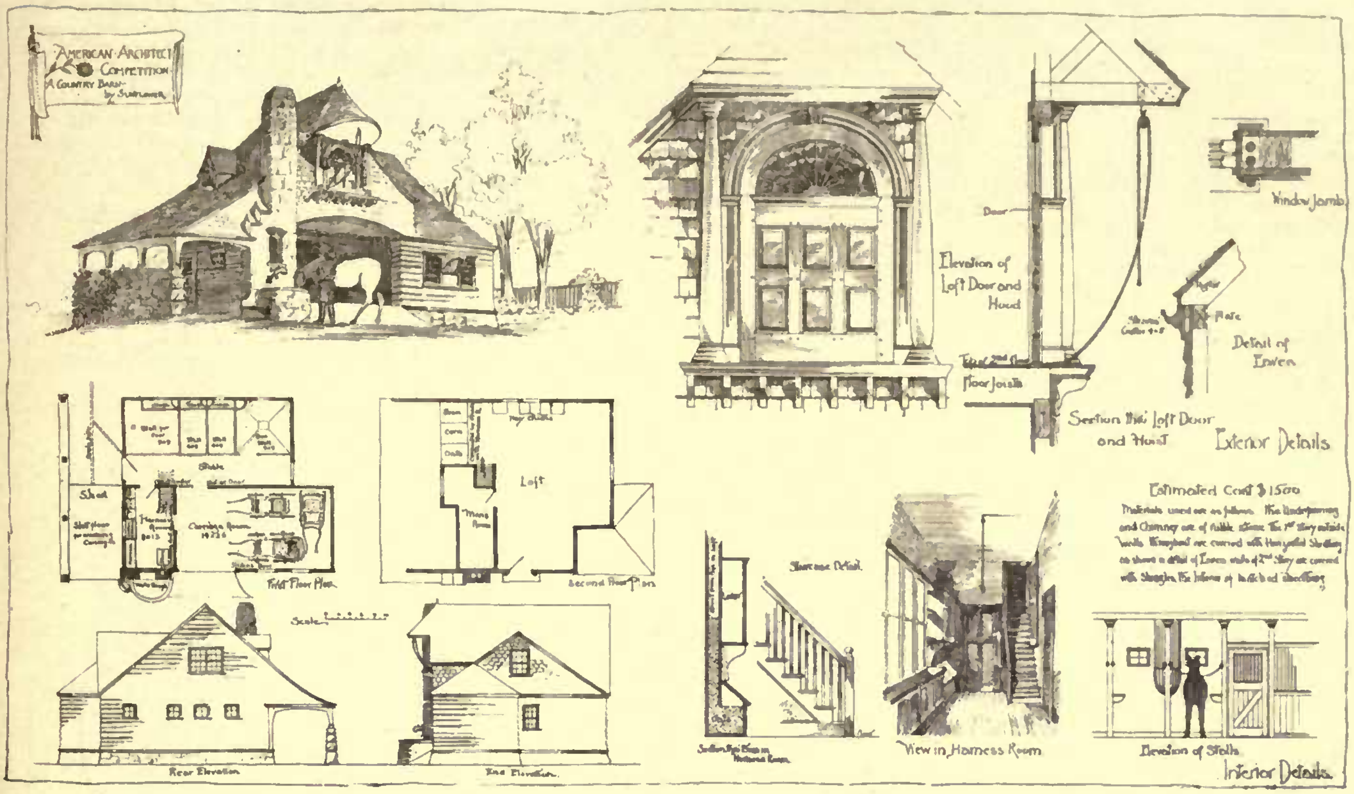


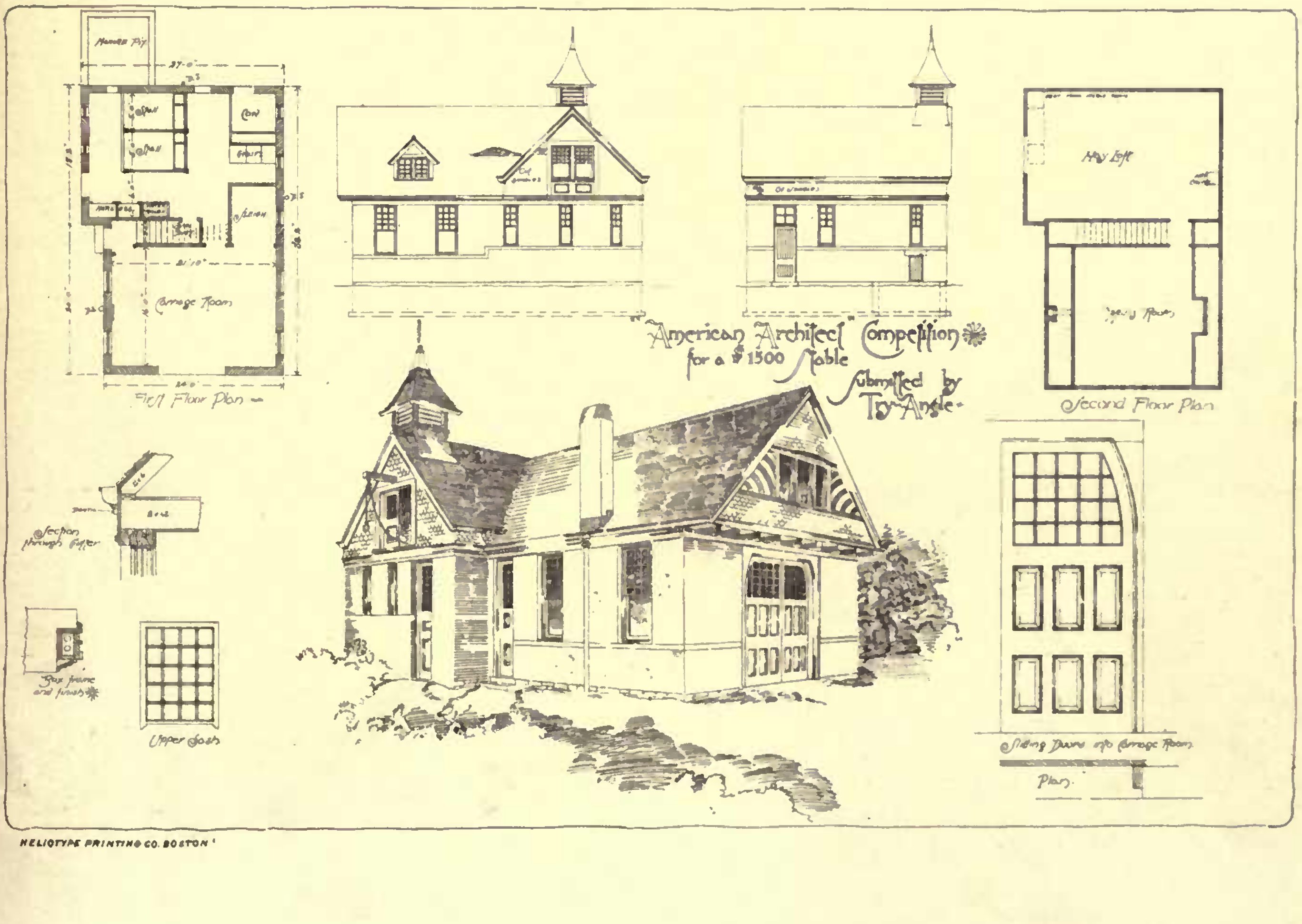
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COMPETITIVE DESIGN FOR THE CINCINNATI CHAMBER OF COMMERCE · BRUCE PRICE, ARCHITECT, NEW YORK.





HELIOTYPE PRINTING CO. BOSTON

they very wisely and prudently, before commencing improvements, took in the whole situation by having prepared a sketch of their ultimate façade, and, adhering strictly to that, erected their first instalment as an integral part of the whole. The smaller drawing will explain the general design of the final block. The whole front as far as now built is of common brick and terra-cotta. Although it is to be regretted that the lack of time prevented the adherence to all the details of the architect's design (there being introduced into the work many and various samples of past work made from moulds on hand in the shop), still the result as a whole is broad and characteristic. The building is of mill construction throughout. A large quantity of manufactured goods were on the plank roof at the time of the late fire, and to the mode of construction is due the fact that the structure remained intact after a fire which would have brought an ordinarily constructed building to the ground.

COMPETITIVE DESIGN FOR A STABLE SUBMITTED BY "*Try-Angle.*"

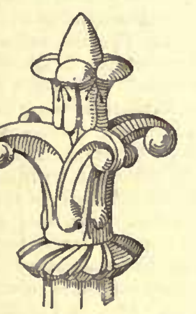
CINCINNATI, O., December 17, 1884.

FROM estimates I have made from the plans and specifications of stable submitted by "*Try-Angle,*" it can be built for $1,676.00.

J. M. GABLE.

COMPETITIVE DESIGN FOR A STABLE SUBMITTED BY "*Sunflower.*"

CONSTRUCTION OF THE BROMPTON ORATORY CUPOLA.[1]



Finial Notre Dame Paris.

HAVING said all that I consider necessary on the subject of marble, I think I could not do better than allude to the material of which the vaulting and cupola are composed, namely, concrete. Some ten years ago, when I first made an attempt to furnish a design for the Oratory Church, I was an ardent admirer of the ancient temple of Minerva Medica at Rome, which is circular, or rather pentagonal, on plan, and 75 feet in diameter, and surrounded by a concrete cupola, the apex of which is 85 feet from the ground. Now, with this example before me, I felt that what was done in the days of the Romans may be accomplished by the people of the nineteenth century, and so I suggested the same material for the ceiling of this church, the nave of which is 51 feet wide and the cupola 53 feet in internal diameter; but when the time arrived which made it necessary to be particular in giving instructions, I experienced a little anxiety about it, but nevertheless commenced in the case of the vaulting over the nave by filling up the haunch of one angle to a specified height, and then allowed it to rest. The opposite angle was next dealt with, and so on, after the same manner, until the four were filled up. By this time the first one was sufficiently set to allow the commencement of the vaulting proper, which was, I think, 14 inches thick, and finishing at the apex with a thickness of only 7 inches. To assist the workman in properly diminishing his thickness, I had a number of blocks of various heights temporarily tacked on to the centring by way of a gauge, which were easily removed as his work reached them, and his progress in one angle would be about 2 feet at a time, when he would leave it for the next angle, and so on until the completion of the four. It was then allowed to rest one month, when the centring was removed and transferred to do duty in another bay. My first impression was that the concrete could not be made to retain its shape unless it had some protection on the extrados, but my experience showed otherwise. It is true that the more perpendicular the curve the less should be the height of the rings. For instance, in the case of the dome, I first commenced with a few inches, and gradually thickened it, and after arriving at a certain thickness, of, say, 18 inches, I continued it by a 6-inch layer in a spiral manner, as one would wind the cord around a boy's top, and if the concrete is conscientiously made, a night's rest will enable the work done on the previous day to be sufficiently solidified to commence the next course; and the whole process seemed to be of the most simple description, and was carried out by an ordinary navvy. The composition of the concrete was originally specified as composed of six parts, viz., one of cement, two of washed sand, and three of crushed clinkers, engine slag, and burrs; but I must inform you that I eventually did not adhere to this arrangement, as I abolished the use of the slag and the clinkers totally, fearing that such an ingredient would prove detrimental to the surface of the plastering by unsightly stains, and consequently destroy the frescoes or such other decorative treatment as may hereafter be indulged in. I therefore confined myself to the brick burrs, with a slight admixture of crushed stone, a little ballast, and but a comparatively small quantity of sand. My reason for lessening the quantity of the latter is that, the brick burrs and the stone being broken by a steam crusher, it produced a large amount of dust and fine material, which did the duty of the sand; in fact, the proportion was continually varied, according to circumstances. All that was wanted was to secure a well-mixed composition, of the consistency of a puddle, and as free as possible from any adulteration of clayey gravel, and if I recollect rightly each cubic foot weighed just 112 pounds to 118 pounds, and, according to this calculation, each bay in the nave averaged from 60 to 70 tons in weight, and the cupola above the arches, including the upright portion of the dado, would reach to at least 2,000 tons, of which the marble columns have to take their proportion of the pressure. The time elapsed since this portion of the work was completed is two years, and during that period there has been no indication of weakness, or of its having played its part falsely; in fact, I look upon it as having done quite the reverse, and it has proved most satisfactory.

There always exists one enemy to deal with in adopting a concrete made with Portland cement, and that enemy is, I am sure, well known to you all — its tendency to expand on the point of setting; and although I demanded that all cement should be well air-slacked under my own observation for at least three weeks before using, the cupola did expand, and the result is most vividly seen in the outer octagonal wall of the cupola, which was started at the angles by the pressure conveyed to the eight buttresses. Notwithstanding the annoyance caused by this unfortunate propensity, it has many good qualities which we must all acknowledge, such as its great strength and facility for setting rapidly. For instance, let us inquire into the time occupied in forming the vaulting, and compare it with that which would be absorbed by a bricklayer. First, there were, I think, six men engaged in mixing the concrete; one assisting at the steam hoist, one with a barrow from the lift to the vault, and one navvy whom I shall call the distributor — nine men in all; and each bay with an arc of, say, 70 feet, and 30 feet wide, containing about 70 tons of material, was finished within a week — that is to say, we commenced on Monday morning and finished on the following Saturday evening; and I feel that if the same were executed in brickwork it would have occupied at least four times the period, and a proportionate increase of expense. The cupola, to the best of my recollection, was completed within three weeks of its commencement, but is not wholly of concrete, as the upper portion is built of brickwork in cement, and the ring upon which the stone lantern will ultimately rest is of Portland stone.

I feel it is needless for me to tell you that the present unsightly exterior of the cupola is only temporary, the design for the permanent structure being at least 11 feet more in diameter and 14 feet higher to the base of the lantern, which latter will add another additional 22 feet or thereabouts. Nothing has been definitely settled about the material with which it is to be covered, but at the time this portion of the work is undertaken, if the funds permit, I shall recommend its being covered with copper, on account of its lightness; but I would not hesitate to-morrow to use five-pound lead. I certainly look upon the circumstance of our not completing this part of the structure (whilst all the plant and machinery was at hand) as a great calamity, for to do so at a future date will probably increase its cost by about 70 per cent. You will observe the form that I have given to this section of the dome, which is considerably tilted, and at the point of rupture I have placed wrought-iron bands; not that I think they will contribute much to the stability of the structure after the concrete has set, but I thought they would assist in preventing a flaw while it was green. There can exist not the slightest doubt but that the cupola is one of the strongest of constructional forms, for although its section is that of an arch — but being circular on plan — it is really composed of an innumerable number of rings having a lateral bond, which must be torn asunder before any fracture can take place.

I may also inform you that it was my original intention to have embedded in the middle of the concrete vaulting hoop-iron bond interlacing each other, for the purpose of securing a toughness to the material; but subsequently I felt that the presence of iron in such a substance would eventually do more harm than good by its oxidation, and, on the other hand, if the concrete was unable to support it, no amount of hoop-iron bond would enhance its stability, and so I abandoned it altogether. Among the diagrams exhibited to you I have a drawing giving a bird's-eye view of the drum of the cupola, showing the general features of its construction, and also another giving a vertical section through the pendentives. In the first you will observe the method I adopted in lightening the weight of the drum by recesses and cavities, and also the expedient adopted to resist the lateral pressure of the ring on the four arches caused by the inward tendency of the four pendentives, which are so arranged that the force is resisted by the vaulting of the nave and transepts. A rough estimate of the weight coming on the four internal arches amounts to about 2,000 tons, less the reduction for the recesses, etc., 100 tons, or nearly 500 tons on each arch, which are composed of ten 4½-inch brick rings in Portland cement, bonded into each other and springing from skewbacks, as shown on the drawings, which I carried up in horizontal courses to at least one-third the height of the arch. This arrangement enabled me to get on to the top of the skewback the maximum of perpendicular weight, instead of throwing it on the extrados of the arch.

[1] From a paper read before the Civil and Mechanical Engineers' Society, Wednesday, March 25, 1885, by Herbert A. K. Gribble, A.R.I.B.A.

THE MISSISSIPPI RIVER-BED LEAKING. — Minneapolis, which has long boasted of having one of the best, if not the best, of water-powers in the world, is deeply disturbed over an apparent failure thereof. The water in the Mississippi has gradually been growing more unreliable for milling purposes for some time. Lately a discovery was made that about forty thousand gallons per minute are escaping from above St. Anthony's Falls in some mysterious manner. The supposition is that the water vanishes through a subterranean channel. —*Milwaukee Evening Wisconsin.*

THE RELATIONS BETWEEN ENGINEERING AND ARCHITECTURE.[1]



Lions' Heads. Assyrian Sculpture.

WHAT *are* the relations between engineering and architecture? We may take them to be, on a reduced scale, the relations between science and art. Indeed, it is scarcely an exaggeration to say that the numerous objects brought together in the great museums of science and art are but illustrations of engineering and architecture in the widest sense, with their accessory arts and sciences. These two great departments of knowledge and skill are complementary to each other, as the masculine and feminine natures, strength predominating in the one and grace in the other; and, although they have many characteristics in common, they have each their special place and functions. It may be useful, therefore, and will at least be interesting, to essay a brief consideration of their relative positions and values as honorable and lucrative professions. In order to get clear ideas on the subject, let us try to attach a definite meaning to the expressions employed.

What is engineering? For an answer to this question we naturally turn to the great Society which is the recognized embodiment of all that is foremost in the engineering world. Now, the Charter of the Institution of Civil Engineers contains a lengthy attempt at a definition of "that species of knowledge which constitutes the profession of a Civil Engineer." It is there described as "the art of directing the great sources of power in Nature for the use and convenience of man, as the means of production and of traffic in States, both for external and internal trade." This is the gist of the definition, which then goes on to specify five main branches of "the art," "as applied (1st) in the construction of roads, bridges, aqueducts, canals, river navigations and docks, for internal intercourse and exchange; and (2d) in the construction of ports, harbors, moles, breakwaters and light-houses; and (3d) in the art of navigation by artificial power for the purpose of commerce; and (4th) in the construction and adaptation of machinery; and (5th) in the drainage of cities and towns." This definition is not very clear, and not quite comprehensive. There is no mention of railway, mining, hydraulic, gas, or electric engineering; and it is only with great difficulty that these important branches of the subject can be brought within the scope of the definition. The fact that some of them had not been developed at the date of the Charter is not a sufficient answer to the objection, and even this explanation does not account for the omission of mines and water-works. Too much stress is laid on using the power of Nature "as the means of production and of traffic" for purposes of *trade*, whilst, at the same time, what has come to be called "sanitary engineering" is distinctly included. These considerations incidentally show the wisdom exercised by the founders of the Liverpool Engineering Society in adopting so expressive and practical and comprehensive a title, and in admitting to its membership "engineers of any branch of the profession." It is *engineering* with which we are concerned, not any one branch of it, not even such an extensive one as that known as *civil* engineering. And, without venturing on any exact definition, it will perhaps be sufficient to say that engineering is that entire system of knowledge and skill which comprises all mechanical pursuits so far as they supply the material wants of men.

What is architecture? "The art of ornamental and ornamented construction," chiefly as applied to buildings and such-like structures. Building, considered as a science, is clearly an important branch of engineering. And, as architecture is chiefly concerned with building, it follows that engineering is, in one aspect, an essential component of architecture, though the science may subsist without the art. In other words, whilst there can be no architecture without engineering, there may be engineering without architecture. Therefore we are led to the conclusion that architecture is the development and refinement of an important branch of engineering. Thus, in a certain sense, the profession of architecture is in its higher capabilities, more honorable than that of engineering. For it is disparaging to any particular architect to say of him that he is merely an engineer, since this is equal to saying that, so far as his artistic abilities are concerned, he is not an architect but a builder. And on the other hand it is not regarded as a discredit to an engineer to pronounce him to be no architect. The sum of these considerations is that engineering construction is scientific and utilitarian; whilst architectural construction is not only scientific and utilitarian, but is also ornamental, and even artistic or beautiful. This distinction is not exact, and cannot be made so. At the same time it is practically convenient, and expresses the principal facts.

Having cleared the way thus far, it may be profitable to inquire (1st) whether the relations between engineering and architecture are fixed and unalterable, and (2d) whether, if they are not permanent, it is desirable that they should be modified in practice. Now, when we endeavor to ascertain whether the relative positions of these pursuits are stable or not, we have to glance at their history. With regard to engineering, many of the mechanical arts and sciences comprised in it are so modern in their origin and development that they can hardly be said to have a history. Engineering, as a profession distinct from architecture, is a thing of to-day. Architecture also, as a "profession," is comparatively modern. But engineering and architectural pursuits have occupied men's talents and energies from the earliest times. They were always formerly practised by the same persons. The new feature is that they now diverge into separate channels. This is, of course, only a phase of the nineteenth-century system of the division of labor. And as that principle is constantly operating in all departments of knowledge and skill, and must go on dividing and subdividing every trade and profession as the knowledge and skill grow more exact and positive, it appears quite probable that engineering and architecture, as now understood, will never again be practised together to any great extent by the same persons at the same time. But, as we have said, it was not always so. And there is no reason in the essential nature of things why it should be so now. Chiefly what may be said is that the requirements of latter-day science have made it inconvenient and difficult for any one man to follow at once engineering and architecture equally well.

And, secondarily, it must be acknowledged that modern ideas as to the province of the architect have much to do with the severance which we are considering. It appears to be taken for granted that the work of the architect should be confined entirely to buildings. But the modern historian of architecture (Fergusson) maintains that "there are no objects that are usually delegated to the civil engineer which may not be brought within the province of the architect. A bridge, an aqueduct, the embankment of a lake, or the pier of a harbor, are all as legitimate subjects for architectural ornament as a temple or a palace. They were all so treated by the Romans and in the Middle Ages, and are so treated up to the present day in the remote parts of India, and wherever true art prevails." Now this is but equal to saying that in many large public works there is room for the engineer and the architect alike, or, at least, for their special talents. The architect should have some advantage, however, in the fact that the scope of his calling is wider, if fairly regarded, as it includes much that is simply engineering. But if the principle of the division of labor is to run to its natural issue, architecture will be considered as supplementary to engineering, not subordinate, perhaps, but rather superior, in the sense of its being the application of embellishment to the naked structure, or the incorporation of ornament into it, or the tasteful disposition of its parts. For, as Fergusson says, "where the engineer leaves off, the art of the architect begins. His object is to arrange the materials of the engineer, not so much with regard to economical as to artistic effects, and by light and shade, and outline to produce a form that, in itself, shall be permanently beautiful." If these considerations are allowed to have due weight, they tend to show that, although the connection between engineering and architecture has become relaxed, it is quite capable of being drawn tighter, and that the two branches of construction are by no means firmly settled apart, notwithstanding the force of convenience and custom, and the general disregard of art and beauty. It is, therefore, practically possible that the engineer should be more of an architect, and that the architect should be more of an engineer.

We may now turn to the second part of our inquiry. For if we have shown that the relations between engineering and architecture are not fixed and unalterable, the question naturally follows, whether it is desirable that those relations should be modified in practice. Now, the answer to this question will depend upon another, which has already been touched at some points: How does the present arrangement work? Take, for instance, the specially modern case of a railway and its appurtenances. The actual railway itself, both as to the surveys for its course and the planning and construction of its different parts, is the work of the engineer. The tunnels and bridges are as properly assigned to him as are the track and the signals. And, in many instances, the station buildings are regarded as coming equally within his province to design. If, however, the buildings are of great extent, and occupy an imposing site in a large town, they are sometimes put into the hands of an independent architect, with a view to insuring, amongst other things, a fairly artistic effect. This is constantly the case when the station buildings are connected with an hotel placed so as to mask the station itself. And, although the smaller or country stations are frequently designed by the engineers of the company, there are instances where high-class architectural firms are employed to take in hand everything in the nature of buildings connected with these stations, including even the roofs of iron and glass, which are often of greater extent than the actual buildings, and attract more readily the notice of the public. So that in these examples, whilst we see the architect and the engineer each venturing into the other's domain, or what is usually so considered, we see also that the architect is the chief aggressor, and gets most of the spoil. When, however, the engineer reaches the open country, or even the streets of the town, he works his own will on the bridges, viaducts, embankments, tunnels, ventilating shafts, *et hoc genus omne.* Especially with regard to goods-stations and warehouses, the engineer has it all his own way, and directs the expenditure of vast sums on these buildings, acting in the capacity of an ordinary architect. In this respect the architect may consider that his preserves are being poached by the engineer.

Turning now to another branch of engineering, that connected with water-works, what do we find? The reservoirs and pipe-lines, and the works connected therewith: tunnels, bridges and pumping-

[1] A paper read before the Liverpool Engineering Society, April 22, 1885, by W. Goldstraw.

stations, with their buildings and machinery, all come naturally within the engineer's legitimate business. And none of these works are now even thought of as belonging to architecture, although there is much scope for architectural taste in many of the embankments, aqueducts, towers, engine-houses and such-like structures. At any rate, since the rise of engineering as a separate profession, the architect has had to yield up possession of these works. When, however, the water has been duly conveyed to a large town, and the question of providing public baths and wash-houses presents itself, the architect either steps in or is called in, and the buildings at least, are made to receive the impress of his art, even though the actual purposes of the edifice have to be fulfilled by the special work of mechanical and hydraulic engineers. In some cases, it is true, the local authorities do not employ an independent architect, to design such buildings, but entrust them to their own town surveyor, borough engineer or water engineer, or whatever his official style happens to be. This officer, from the nature of his duties, has really a dual character: with regard to the now more or less distinct vocations of engineering and architecture, he has to fulfil a double function, which is, of course, not confined to the erection of the buildings we have mentioned, but extends to all the various engineering and architectural works of the public authority in whose service he is engaged. And so with the dock or harbor engineer. Although in his case, undoubtedly the bulk of his work is such as must be classified now-a-days as engineering, yet he is called upon to design and construct many buildings and other structures which have, or should have a decidedly architectural character, such as piers, light-houses, hydraulic-machinery buildings, public waiting-rooms and offices, clock-towers, and other erections. Here, again, the engineer may be said to trench upon the hereditary domains of his cousin the architect. Even in connection with the partially lapsed art of canal-making, the engineer is probably destined to renew his acquaintance with the architectural features of numerous locks, bridges and aqueducts, to be constructed (even in this iron age) for the most part of stone, which has always been the pet material of the architect. As to the followers of the more purely mechanical branches of engineering, so closely connected with machinery, they are developing a kind of natural affinity for architectural work in quarters, where it was least expected. In times not long past, the projectors of extensive factories and works to be fitted up with peculiar or costly machinery were accustomed to employ an architect for the erection of the building, and a special engineer for the supplying and fixing of the machinery. Considering that an ordinary architect is equally ready to design a church or a distillery, it is hardly surprising that his Ishmaelite relation, the engineer, should wrest from him some of the specialities, and appropriate them to himself. Accordingly, we find new tribes of the great engineering family flourishing as gas-works engineers, sugar-works engineers, brewery engineers, cotton and silk mill engineers, and so forth, who undertake the designing and constructing of the great piles of building which are to enshrine the machines and engines required for that particular trade or industry. Occasionally it happens, nevertheless, that an architect of high standing, chiefly concerned with the more artistic side of his vocation, is employed to plan and execute buildings which are now by general consent, regarded as the proper work of the engineer. In such cases as these, whether it is of their own will, or at the will of the public, the members of the two professions are playing a friendly game of tit for tat. The present condition of things, then, appears to be this: — The practical relation between engineering and architecture are not sharply defined nor carefully observed.

We may now recur to the question whether these relations ought to be modified. If so, should the two great branches of constructive skill be drawn closer together, or should they be made more distinctively separate? Now, can it be maintained that the present state of affairs is satisfactory? This is not a quasi-philosophical question, but a very practical one. Two kinds of interests are involved in it — the interests of the persons whose occupation or livelihood is concerned in it, and the interests of art in its æsthetic aspect, whereby intellectual happiness is influenced. Well, in so far as uncertainty and confusion exist in the relations between engineering and architecture, it seems expedient that their boundaries should be more exactly laid down. Like two great political states, these two great professions, as they grow more powerful and approach more closely, have the greater need of a clear understanding as to their natural and scientific frontiers. In this age, few professional men can govern in both provinces. Even the admirable Crichtons will have enough to do with their talents in either domain. But as things are, we see one practitioner styling himself "Civil Engineer and Architect," whilst another is described as "Architect and Civil Engineer." These men are no doubt at present performing a special and useful function. But the race will die out. A pupil articled to such an engineering architect must be greatly perplexed by his divided allegiance to Rankine on the one side, and Palladio or Pugin on the other. It was much easier for Tintoretto to live up to his motto, "The day to Titian: the night to Michael Angelo," than for a nineteenth-century student to set his affections profitably on Gothic vaulting or the Ionic capital, when he is chiefly engaged in a sewerage scheme, or a system of tramways. Clearly, it is desirable that he should understand, as far as possible, the distinction between engineering and architecture, even if he has to draw an arbitrary line for his own observance. But in thus making the two professions more distinctively separate, there is no reason why the natural bond between them should not be respected or even drawn tighter. If architecture is the mother and engineering the daughter, they should be on good terms. Nevertheless, a man does not marry his mother-in-law, and as a rule they agree better when living apart. Let the engineer and the architect each stick to his last. Whilst, however, he practises his special calling only, he ought to have a considerable knowledge of the other profession in those points where he necessarily touches it. The architect cannot be well qualified generally if he is ignorant as to the capabilities of iron columns and girders, and of concrete floors, the overturning force of the wind, the pressures of embankments against walls, and the laws of mechanics. Nor can the engineer satisfactorily design his bridges and towers if he has no knowledge whatever of either the Classic orders or Gothic styles. For, although, as Fergusson remarks, "it is not essential that the engineer should know anything of architecture, it is certainly desirable that he should do so." On the other hand, it is indispensably necessary that the architect should understand construction. Without that knowledge, he cannot design; but it would be well if, in most instances, he could delegate the mechanical part of his task to the engineer, and so restrict himself entirely to the artistic arrangement and ornamentation of his design. This division of labor is essential to success, and was always practised where art was a reality; and no great work should be undertaken without the union of the two. "Perfect artistic and perfect mechanical skill can hardly be found combined in one person, but it is only by their joint assistance that a great work of architecture can be produced." If this be so, and it will hardly be doubted, the work of the man who styles himself architect and engineer is not likely to be of the very highest merit. In the present relations between the two professions, however, such a practitioner makes himself respected or feared on both sides, and deservedly so. But as the distinction between them becomes better defined and more generally recognized by the public, his position will be increasingly difficult, and in the end untenable, This need cause no regret, for, as we have seen, it is desirable in the interests of both professions that they should be as much as possible *practised* apart, even when a considerable acquaintance with both confers an advantage on its possessor.

We appear, then, to have been led, whether we are willing or not, to the conclusion that engineering and architecture ought to be made more distinctively separate. But can they not, at the same time, be in some way more closely united? If an ordinary man is not Colossus enough to bestride the strait between the two professions, may he not take his stand on one side, and join hands with his friend on the other? Now this thought brings us to a practical suggestion, with which this paper may fitly be drawn to a close. Seeing that engineering and architecture are both concerned with building work, and must always approach each other more or less nearly, it would probably be a successful working arrangement in many cases if a well-qualified engineer and a well-qualified architect were to join in partnership. Such a style as "Septimus Jones, F.R.I.B.A., and Orlando Smith, M. Inst. C.E., Architects and Engineers," if justified by the quality of the work done by the firm, would carry weight with the public, and would secure many commissions which Jones or Smith by himself would fail to get, or would imperfectly carry out. Thus we finish with a marriage, and every one is happy, or ought to be so. Should the blessing of Providence rest on it, and any good issue result from it, then the time spent in considering this subject will not have been utterly wasted.

SGRAFFITO WORK IN THIS COUNTRY.

PHILADELPHIA, PA., June 23, 1885.

To THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — My attention has just been called to the inquiry of Messrs. Wahrenberger & Beekman, in your issue of June 6, and in reply thereto I will state that I have made sgraffito work to some extent during the last four years, for the interior and exterior decoration of buildings in Philadelphia and vicinity, and it has proved substantial and generally satisfactory.

Yours respectfully, J. GIBSON.

FRESH OR STALE PORTLAND CEMENT.

NEW YORK, June 22, 1885.

To THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—Having noticed a question with an editorial comment on the above subject in the last number of your valuable paper, and being somewhat familiar with the subject, I take the liberty of throwing out a few hints which may prove to be of some interest to you and to many of your readers.

A good Portland cement, prepared on accurate technical lines, when kept in the barrels, and if preserved from damp and kept out of draughts, will retain its power and value for many years; it will become somewhat more slow-setting, but increases in cohesive power when set. If there is one quality in Portland cement more valuable than another, it is the property of retaining its power and value for an indefinite period of time.

In Germany, where testing is much more general than in any other country, and where, therefore, a better knowledge of the subject prevails, a manufacturer who would advertise his cement as being "*always fresh*," would render himself very ridiculous, because every

intelligent user of cement there knows very well, and has known it for years, that a Portland cement which is good only when fresh cannot be a first-class article. In fact, many German manufacturers of concrete, when buying first-class Portland cements, always ask for old cement, because they know from experience that it is stronger and more economical, allowing a larger addition of sand than the fresh cement.

Dr. W. Michaelis, of Berlin, gives the chemical analysis of a first-class German Portland cement as follows: —

Silica	22.850
Alumina	5,511
Oxide of iron	2,760
Lime	64,409
Magnesia	1,235
Potash of soda	0,923
Sulphate of lime	2,865

and of such always uniform, strictly first-class brands there are only three in Germany, and none that I know of in England. English architects and engineers, before using Portland cements, do well therefore in having them air-slaked, as described in your paper, a savage method which should never be applied to strictly first-class Portland cements, which do not contain free lime.

Further and more ample information can be gathered by the perusal of the best English book on the subject, Henry Reid's "*Practical Treatise on Natural and Artificial Concrete, and its Varieties and Constructive Adaptations*" (E. & F. N. Spon, 46 Charing-Cross, London, and 35 Murray Street, New York), showing, also, the danger, costliness and inadvisability of using inferior brands of Portland cements. I am, Dear Sirs, Yours obediently,

Gustav Grawitz,

NOTES AND CLIPPINGS.

The Palazzo Reale, Naples. — "Those who know Naples," says the London *World*, "and, of course, the Palazzo Reale, will be much interested to learn that the King of Italy has ordered, at his own expense, eight life-sized marble statues to be placed in the existing niches on the façade of the palace. The personages to be represented are to be eight kings of Naples, viz: Roger, Frederick II, Charles I of Anjou; Alfonso, of Aragon; Charles V, Charles III, of Bourbon; Joachim Murat, and Victor Emanuel. The sculptors selected, all Neapolitans, are Amendola, Belliazzi, Caggiano, Jerace, D'Orsi, Franceschi, Gemito, and Solari."

The Arc de Triomphe, Paris. — The number of names of battles, sieges, and captured towns engraved upon the Arc de Triomphe, Paris, is 153, the first being the battle of Valmy (September 20, 1792), and the last the combat of Ligny, which preceded the battle of Waterloo, and is claimed by the French as a victory. The number of marshals, generals, and other field-officers whose names are also to be read upon the walls of the arch is 658, of whom 126 were killed upon the field of battle. The first of the 653 names is that of "Chartres," the son of Philippe Egalité, better known to history as Louis Philippe, who, like his father, distinguished himself at Valmy. Upon the summit of the arch, facing the suburb of Neuilly, is the inscription, which, translated into English, would read, "This monument, commenced in 1806 in honor of the Grand Army, for some time left unfinished, was continued in 1836 by King Louis Philippe I, who has consecrated it to the glory of the French armies." The Arc de Triomphe is the largest monument of its kind, being 165 feet high by 150 feet broad and 75 feet thick. It is rather more than double the height of the Arch of Constantine at Rome. The total cost of the Arc de Triomphe was £372,140. —*Exchange*

The Great Pyramid. — Mr. J. B. Bailey writes to the *St. James Gazette* as follows, with reference to the desirability of exploring the great pyramid: Now that Great Britain is dominant at Cairo, would it not be a good plan to clear away the sand and rubbish from the base of the great pyramid right down to its rocky foundation and try to discover those vast corridors, halls and temples containing priceless curiosities and treasures with which tradition in all ages has credited the great pyramid? The wonderful building, of such exquisite workmanship, was erected many years before any of the other pyramids, which are only humble imitations, built by another nation, and also for other purposes; for neither King Cheops nor anybody else was ever interred beneath this mighty mass of stone. The smaller pyramids also exhibit neither the nicety of proportion nor the exactness of measurement, both of which characterize the first pyramid. From internal evidence it seems to have been built about the year 2170 B. C., a short time before the birth of Abraham, more than four thousand years ago. This — one of the seven wonders of the world in the days of ancient Greece — is the only one of them all still in existence. The base of this building covers more than thirteen square acres of ground. Its four sides face exactly north, south, east and west. It is situated in the geographical centre of the land surface of the globe. It was originally 485 feet high, and each of its sides measures 762 feet. It is computed to contain 5,000,000 tons of hewn stone, beautifully fitted together with a mere film of cement. And these immense blocks of stone must have been brought from quarries five hundred miles distant from the site of the building. The present well-known king and queen chambers, with the various passages, might also be thoroughly examined by means of the electric or lime lights. The astronomer royal of Scotland some years since closely and laboriously examined all that is at present known of the interior of this enormous building. He states that measurements in the chambers, etc., show the exact length of the cubit of the Bible — namely, 25 inches. This cubit was used in the building of Noah's ark, Solomon's Temple, etc. He also maintains that the pyramid shows the distance of the sun from the earth to be 91,840,000 miles.

The Failing Connecticut. — The Connecticut River, given over to the timber-drivers, has become a canal. Reefs are blasted out. Bulkheads are built to turn the current into the central channels. The melting snows, no longer held back in the spongy mosses of the forests, and the spring rains, are hurried swiftly down in freshets which destroy property in the lower country. The freshets are utilized to bring down every spring the timber from thousands of acres, where no pine wood will ever grow again. The summer comes, hot and dry, with low water in the rivers, which were formerly full all the summer from the slow drain out of the dark shades in the upper country. The natural reservoirs, which thus gave out slowly their reservoirs of water, are gone, and all the water comes down with a rush after every rain. Manufacturing companies everywhere have found it necessary to make artificial reservoirs to take the place of the lost natural reservoirs. Hills that were once forest-covered are bleak masses of rock, growing drier year by year. If there was ever an instance of killing the goose that lays golden eggs, it is in this method of treating our northern forests. In hundreds of valleys, where water was abundant in former years, the water line in the ground is now below the reach of ordinary wells. The tendency is toward that condition which in a century or two will compel a resort to irrigation for ordinary agricultural purposes. —*Dr. W. C. Prime in the New York Journal of Commerce.*

The Daily Traffic over Broadway, New York. — Whatever may be thought of Jacob Sharp's Broadway surface-railroad, he has been the cause of the gathering of some interesting statistics regarding the enormous amount of traffic in Broadway. Four men were recently stationed at Fulton Street and Broadway to count the vehicles passing through Broadway at that point from 7 A. M. to 6 P. M. The total number was 22,308 for the period of eleven hours — about 2,000 an hour, thirty-three a minute, or one every two seconds. The largest number of any one kind of vehicles was of single and double trucks, 7,384; the smallest number was two; these were ambulances. There were 3,390 single and double express wagons. The 2,310 stages and the 1,022 cabs were next in order of quantity, pedlers' wagons numbering 938, produce wagons 446, rag trucks 375, carriages 354, coal carts 324, and venders' wagons 300. Then there was a drop to hacks, 288, and butcher wagons 223. The variety of vehicles was striking, there having been eighty kinds according to the schedule. Every conceivable article of transfer appears to be poured into Broadway. The private carriages were completely engulfed in the 150 ash-carts; the two ambulances and three funerals made a melancholy showing amid the seventy-three loads of dead hogs, the sixty-four garbage and the seventy-three dirt carts. The lager beer wagons and the orange pedlers flourished on an equality; the bone and lumber wagons went neck-and-neck; the pie and the sugar wagons were half-and-half, which should give the pies sweetness; the milk were left behind by the swill wagons. The mixture presented was something appalling. Kerosene, milk, old iron, sawdust, rags, sugar, ice, beer, bones, oranges, ashes, pie, hogs, tripe, tin, tallow, tea, tar and undertakers were commingled in a bewildering confusion. Broadway is certainly a remarkable thoroughfare. —*New York Tribune.*

Fire-Proof Doors. — The most efficient fire-proof doors are of wood covered with tinned iron. The door is made of two thicknesses of tongued and grooved boards, crossing each other diagonally and thoroughly nailed together. The sheets of tin are bent over at the edges, forming locked joints as in a tinned roof; it is important that the edges, as well as the sides of the door, be covered, as its resistance to heat lies in the fact that the fire cannot burn the wood thus protected against exposure to the air, nor can it warp it, as is the case with an iron fire-door subjected to slight heat. If a fire-proof door is hung on hinges, especial care must be taken to insure their security by fastening them to the door by means of bolts, rather than screws, and connecting them to the wall in an equally secure manner. The latches should be selected with a view to durability, as such a heavy door is apt to be destructive of weak latches. Where the position of the doorway permits sliding doors, it is preferable to have them on tracks, care being taken that cleats be placed on the floor each side of the doorway, so as to secure the door at its lower corners when shut. In the Boston Storage Warehouse, United States, there are a large number of such doors in the fire-walls, arranged to close an electric circuit when they are all shut, and the fact is recorded on the paper dial of the watchman's clock at certain intervals. Fire-proof doors are frequently arranged to close in advance of a fire by means of the yielding of an alloy fusible at 160° Fahr. The track upon which such a door is hung inclines about one foot in eight feet, and the door is kept from closing by means of a round stick about one inch in diameter, which reaches from one edge of the door to the opposite side of the door-frame. At the middle, the stick is cut in two diagonally, and a ferrule made of two pieces of thin copper soldered together longitudinally with the fusible alloy, covers the joint in the stick. When this ferrule is exposed to a temperature of 160° Fahr., its yielding causes the ferrule to split open, and the stick separates into pieces and allows the door to shut. In order that the stick shall not fall in the way of the door, and that the door may be shut at any time, the stick is connected to the top of the door-frame by small chains near to each end. This simple device was designed by Mr. Lewis T. Downes, president of the What Cheer Mutual Insurance Company. Another method of utilizing this fusible alloy to close fire-proof doors and shutters, is by means of a wire extending around the room, and containing in various places links made of two pieces of brass soldered together. When the solder melts and allows the two pieces of brass to separate, the wire allows the shutter or door to close. Mr. Frederick Grinnell has improved the ordinary link by cutting a slot in one of the pieces of brass, and laying a short bit of wire therein, when they are being soldered together; the solder flowing around this wire presents a resistance in three planes, in place of the ordinary joint, which may be imperfect and lies in a single plane, concealed by the sheet brass so as to prevent inspection. Formerly solid links of fusible alloy were used, but the metal has so little resilience that it is apt to gradually lengthen, and finally break at some inopportune time. — *Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

319,974. WATER-CLOSET. — Thomas Gunning and James Quigley, New Haven, Conn.

319,984. MIXED PAINT.—Thomas N. Le Ross, Rochester, N. Y.

319,999. SHUTTER-WORKER. — George E. Potter, Palmer, Mass.

320,002. VENTILATOR FOR GAS-MAINS. — James J. Ricketts, Pittsburgh, Pa.

320,022-024. HOISTING-DRUM FOR ELEVATORS.—Peter L. Weimer, Lebanon, Pa.

320,0 4. WEATHER-STRIP.—Orson E. Woodbury and Henry W. Storck, Madison, Wis.

320,066. FLOOR AND SIDEWALK CONSTRUCTION.—Peter H. Jackson, San Francisco, Cal.

320,072. FIRE-PROOF LATH FOR SLATES.—William H. Lane and Louis Lane, Newark, Ohio.

320,079. BEAM, JOIST, ETC.—Webster W. Martin, Boston, Mass.

320,083. AUTOMATIC HATCHWAY-GUARD.—Walter S. Morton, St. Paul, Minn.

320,097. AUGER.—James Swan, Seymour, Conn.

320,120. WEATHER-STRIP.—Joseph Fisher, Attleborough, Mass.

320,155. MORTISE-LOCK.—Frank W. Mix, New Britain, Conn.

320,161. WINDOW-BEAD FASTENER.—Charles R. Nelson, New York, N. Y.

320,163. WIRE-CLOTH LATHING. — William Orr, Trenton, N. J.

320,169. SAW-HANDLE. — Christopher Richardson, Newark, N. J.

320,175. SASH-FASTENER.—Jos. R. Rusby, Bloomfield, N. J.

320,180. CISTERN AND TANK CLEANER.—Raymond B. Scudder, New Orleans, La.

320,185. FRICTION DRILL-BRACE.—Richard S. Solomon, Cape Town, Cape of Good Hope.

320,195. WINDOW-SASH.—Henry Vale, Chicago, Ill.

320,203. STEAM-RADIATOR. — Juan B. Arci and John Chapman, Brooklyn, N. Y.

320,224. VISE.—George A. Colton, Syracuse, N. Y.

320,235. CONSTRUCTION OF SKYLIGHTS, ETC. — Alphonse Friedrick, Brooklyn, N. Y.

320,251. VENTILATOR. — Reinhold E. Henninges, Cleveland, O.

320,255. HINGE.—David K. Jackman, Poughkeepsie, N. Y.

320,289. WINDOW-SCREEN.—Morris Roberts, Philadelphia, Pa.

320,294. STONE-CUTTING MACHINE. — William L. Saunders, Jersey City, N. J.

320,323. RATCHET-BRACE. — John F. Allen, New York, N. Y.

320,324. GUTTER-BOX OR TROUGH. — Frederick Axt, Franklin, Ind.

320,327. SASH-FASTENER.—John W. Beatty, Erie, Pa.

320,329. DRIVE-SCREW.—Amos Broadnax, Brooklyn, N. Y.

320,353. SASH-FASTENER.—Reinhold E. Henninges, Cleveland, O.

320,357. WRENCH.—Jacob Huber, Toledo, O.

320,359. GRAINING WOOD.—George H. Hulmes, Chartiers, Allegheny County, and William Shope, Millvale, Pa.

320,371. ROCK-DRILLING MACHINE.—Martin Macdermott and William Glover, London, England.

320 373. DEVICE FOR DRIVING SCREWS.—Frank M. Maley, Cincinnati, O.

320,374. SAFETY DEVICE FOR ELEVATORS.—John H. Manning, Hartwell, O.

320,398. DEVICE FOR FLUSHING TANKS, SINKS, ETC.—Andrew Rosewater, Omaha, Neb.

320,4 9. DECORATING WALL-HANGINGS AND OTHER FABRICS.—William Sochefsky, New York, N. Y.

320,411. VAPOR APPARATUS FOR HOT-HOUSES, ETC. — Hermann Steinke, Brooklyn, N. Y., and Max Limprecht, Union Hill, N. J.

320,428. ROOFING-GAUGE.—Amazon W. Brightwell, Owen, Ind.

320,435. TRAP FOR SOIL AND OTHER PIPES.—Samuel S. Hellyer, London, County of Middlesex, England.

SUMMARY OF THE WEEK.

Baltimore.

STORES AND DWELLINGS.—Morris Oppenheim, Esq., is to have built 2 three-st'y brick buildings on Pennsylvania Ave., near Biddle St., on lot 28' x 120', to cost $8,000, from designs by George Archer, architect; John Hoswell & Son, builders.

George Archer, architect, is preparing plans for Edward Ferry, Esq., for a two-st'y and attic frame cottage, 26' 6" x 35', to cost $2,500.

BUILDING PERMITS. — Since our last report thirty-two permits have been granted, the more important of which are the following: —

John Bruno, 2 three-st'y brick buildings, s s Mulberry St., between Pine and Pearl Sts.

G. W. Donahue, 5 two-st'y brick buildings, e s Duncan Alley, s of Monument St.

John Mehagen, 2 two st'y brick buildings, s a Biddle St., s e cor. Proctor Alley.

Aug. Strunx, 2 two-st'y brick buildings, n e cor. Ridgely and Bayard Sts.

T. H. Graham, 2 two-st'y brick buildings, w s Gilmor St., and 2 two-st'y brick buildings, e s Vincent Alley, between Ramsay and McHenry Sts.

R. N. Moore, 5 two st'y brick buildings, w s Carlton St., between Saratoga and Lexington Sts.

J. A. McGregor, 13 two-st'y brick buildings, e s Payson St., between Ramsay and Christian Sts.

St. Paul Church, three-st'y brick building, s e cor. Cathedral St. and Chapel Alley.

Frederick Burger, 12 two-st'y brick buildings, n s Barney St., between Byrd St. and Riverside Ave.

Wm. Collett, 6 three-st'y brick buildings, w e Bolton St., between Laurens and Robert Sts.

Darby Thompson, three-st'y brick building, n s Chase St., between Charles St. and Maryland Ave.

L. C. Smith, 3 two-st'y brick buildings, n s Barney St., between Hanover St. and Goodman Alley, and 10 two st y brick buildings, e s Charles St., between Birkhead and Clement Sts.

Jas. W. Lindall, 8 three-st'y brick buildings, w s Valley St., between Chase and Eager Sts.

Aug. Meneker & Bro., four-st'y brick warehouse, n w cor. Paca St. and Cider Alley.

L. Reitz & Bro., three-st'y brick building, s s Baltimore St., between Poppleton St. and Calendar Alley.

A. Lurman, three-st'y brick building, s w cor. Hillen and Forrest Sts.

Thos. H. Blick, 6 two-st'y brick buildings, w s Asquith St., n of Point Lane, and 5 two-st'y brick buildings, e s Point Lane, n of Aisquith St.

ALTERATIONS. — Messrs. Deford & Co. are to make alterations to their warehouse, to cost $4,500, from designs by W. F. Weber, architect; Chas. Ogle, builder.

Boston.

BUILDING PERMITS.—*Wood.—Princeton St., No.* 349, dwell., 19' x 28'; owner, Wilbur Goodwin; builder, Isaac Pratt.

George St., near Shirley St., dwell., 21' x 42'; owner and builder, G. A. Clifford.

Rockwell St., 300' from Milton Ave., dwell., 24' x 30'; owner, W. P. Waterman; builder, R. M. Pitman.

Unnamed St., n of Quincy St., near New York & New England R. R., mechanical building, 18' x 50'; owner, Thomas Rice; builder, A. C. Rice.

East Sixth St., No. 559, dwell., 24' x 38'; C. A. Borden, owner; Jacob L. Smith, builder.

Brooklyn.

BUILDING PERMITS. — *Decatur St.*, s s, 125' w Lewis Ave., 4 two st'y brick dwells., tin roofs; cost, each, $5,000; owner, Geo. W. Spear, 258 Grand Ave.; architects, Hall & Newkirk; builder, W. C. Spear.

Fulton St., s s, 300' e Howard Ave., 10 three-st'y brown-stone dwells., gravel roofs; cost, each, $6,000; owner and builder, Thomas Donohue, 103 Stuyvesant Ave; architect, B. T. Hobbin.

Bushwick Ave., *No.* 553, e s, 82' 7" s Adams St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner and builder, Anton Kiesel, 559 Bushwick Ave.; architect, Th. Engelhardt.

Broadway, Nos. 419 *and* 421, n e s, 88' n w Union Ave., rear of lot, 2 two-st'y brick dwells., tin roofs; cost, $5,000; owner, Caroline Broistedt, 378 Broadway; architect, Th. Engelhardt; builders, Geo. Lehman's Sons.

Broadway, Nos. 416 *and* 421, 2 four-st'y brick stores and tenements, tin roofs, iron cornices; cost, $16,000; owner, architect and builder, same as last.

South Portland Ave., *No.* 181, e s, 500' s Hanson Pl., two st'y brick and brown-stone dwell., with stable, tin roof; cost, $8,000; owner, G. B. Wilson, 21 South Portland Ave.; architect, W. A. Mundell; builder, L. W. Seaman, Jr.

Greene Ave., n w cor. Nostrand Ave., 5 three-st'y brown-stone dwells., tin roofs; cost, each, $10,500; owners, G. H. Benner and L. Zeller, 81 Cedar St., New York; architect, A. Munch.

Fourteenth St., *No.* 181, s s, 77' 10" w Fourth Ave., two-st'y and basement brick dwell., tin roof; cost, $4,500; owner, Alexander Balmanno, 226 Seventeenth St.; architect, A. J. Staver.

Delmonico Pl., *No.* 31, e s, 51' 6" s Hopkins St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,370; owner, Wm. Kolb, Ellery St., cor. Delmonico Pl.; architect, Th. Engelhardt; builders, J. Rueger and J. Fuchs.

Hart St., n s, 133' w Marcy Ave., 6 two-and-a-half-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, F. R. Boerum, Nostrand Ave. and Vernon Ave.; architect, I. J. Reynolds; builder, T. E. Greenland.

Berkeley Pl., s s, 359' e Seventh Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $10,000; owner, David N. Boody, 206 Berkeley Pl.; architect and builder, E. B. Sturges.

Varet St., s s, 150' e Bushwick Ave., three-st'y frame tenement, tin roof; cost, $4,000; owner, C. Becker, 146 Varet St.; architect, F. Holmberg; builder, J. Rueger.

Fulton St., s s, 100' w Rockaway Ave., 10 three-st'y brown-stone stores and dwells., gravel roofs; cost, each, $5,000; owner, George R. Brown, 34 South Portland Ave.; builder, L. E. Brown.

Evergreen Ave., *No.* 157, e s, three-st'y frame dwell., tin roof; cost, $1,200; owner, M. Limmerothe, 186 Ellery St.; architect, H. Vollweiler.

Fairfax St., n s, 206' e Broadway, three-st'y frame (brick-filled) hospital, tin roof; cost, $3,200; owner, German Evangelical Aid Society, on premises; architect, H. Vollweiler; builders, Mr. Danken and D. Kreuder.

Bergen St., n s, 225' e Smith St., four-st'y brick flat, tin roof; cost, $11,500; owner, John Newman, Court St. and Bergen St.; architect, R. Dixon.

Sullivan St., *No.* 29, four-st'y brick tenement, tin roof; cost, $5,800; owner, Henry Spawer, 30 Wolcott St.; architect, L. Cook.

Ninth Ave., s e cor. Braxton St., three-st'y brick school, tin roof; cost, $16,000; owner, Thomas S. O'Reilly, Ninth Ave., cor. Braxton St.; architects, Parfitt Bros.

Hull St., n s, 200' w Stone Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,200; owner, John Gardner, 2084 Broadway; architect, J. Purling; builder, M. Horn.

Downing St., w s, 150' n Putnam Ave., three-st'y brick dwell., tin roof; cost, $4,500; owner, J. H. Watson, 421 Grand Ave.; architect, A. Hill.

Berkeley Pl., n s, 160' w Seventh Ave., 3 three-st'y brick dwells., tin roofs; cost, $7,000; owner, John Monds, 92 Park Pl.; architect and contractor, J. J. Gillegan; mason, J. Monds.

Clay St., s s, 125' w Oakland St., three-st'y frame tenement, gravel roof; cost, $3,900; owner, Patrick Kelley, Clay St.; architects and builders, Kandall & Miller.

Bedford Ave., e s, 67' 3" s Flushing Ave., three-st'y frame dwell., tin roof; cost, $3,000; owner, Margaret Colgan, 231 Bedford Ave.; architect, S. Harbison; builder, C. Collins.

Greene Ave., n w cor. Washington Ave., 3 four-st'y brick and brown-stone dwells., tin and slate roofs; cost, $52,5 0; owner, Geo. Harvey, 149 Greene Ave.; architect, Mercein Thomas; builders, C. Cameron and M. C. Rush.

Hamburg St., s w cor. Magnolia St., three-st'y frame store and tenement; cost, $6,600; owner, Lorenz Debold, 18 Wall St.; architect and mason, E. Loersch; contractor, M. Metxen.

ALTERATIONS.—*Pierrepont St.*, *No.* 118, interior alterations; cost, $4,000; owner, D. A. Houghtaling, 321 Clinton Ave.; architects, Eastman & Davis; builder, F. D. Norris.

Myrtle Ave., *Nos.* 680 *and* 682, three-st'y brick extension, tin roof, iron cornice; cost, $3,000; owner, etc., J. Clarke, 675 Willoughby Ave.

Chicago.

BUILDING PERMITS.— W. S. Hinkley, 4 cottages, Oakley Ave.; cost, $2,500.

S. W. Scoville, five-st'y factory, 91 to 102 West Washington St.; cost, $30,000; architects, Adler & Sullivan; builder, A. R. Cook.

Hewitt Manufacturing Co., factory, 213 Ontario St.; cost, $2,500.

V. Holacek, three-st'y flats, 719 Loomis St.; cost, $15,000.

F. Knaswicka, 2 three-st'y stores and dwells., 721 to 723 Eighteenth St.; cost, $12,000.

R. A. Bell, two-st'y dwell., 583 North Oakley St.; cost, $3,2 0.

A. Lowinski & Miketynski, four-st'y factory, 212 to 216 North Green St.; cost, $8,000.

D. Hays, four-st'y store and dwell., 103 West Adams St.; cost, $12,000.

J. A. Yale, 9 three-st'y stores and dwells., 168 to 184 West Van Buren St.; cost, $60,000.

M. Harris, addition, 123 Desplaines St.; cost, $3,000.

McKeever Bros., 4 two-st'y dwells.; cost, $16,000; architects, Thomas & Rogers.

J. T. Lund, three-st'y dwell., 213 Townsend St.; cost, $5,000; architects, Ostling & Bourgeois.

Mrs. H. Lewis, two-st'y dwell., 31 West Indiana St.; cost, $2,500.

J. L. Cochrane, 5 three-st'y dwells., 470 to 478 Elm St.; cost, $40,000; architect, L. J. Halberg.

D. F. Crilly, 12 two st'y dwells., North Park Ave.; cost, $25,000.

R. L. Martin, 6 three-st'y dwells., 92 to 102 Arlington St.; cost, $12,000.

R. L. Martin, two-st'y storehouse rear, 92 to 102 Arlington St.; cost, $10,000.

J. Berndt, two-st'y flats, 93 Gay St.; cost, $2,500.

W. H. St. Clair, five-st'y store, 171 to 173 West Madison St.; cost, $50,000; architects, Burnham & Root.

G. W. Williams, two st'y flats, 62 Evergreen Pl.; cost, $3,700.

C. J. Furst, 2 two-st'y dwells., 207 to 209 Wood St.; cost, $4,000.

C. C. Housel, 3 two-st'y dwells., 427 to 431 Centre Ave.; cost, $15,000; architect, D. Biggot.

W. F. Hickox, 3 two-st'y dwells., 897 to 899 Monroe St.; cost, $18,000; architect, W. Thomas.

H. N. Hanson, two-st'y dwell., 895 Monroe St.; cost, $10,000; architect, W. Thomas.

Mrs. S. Troy, two-st'y dwell., 49 Maplewood Ave.; cost, $2,700.

Chicago City Railroad Co., additional story, 3052 to 3060 Archer Ave.; cost, $20,000.

J. A. Heath, 2 two-st'y dwells., 3128 to 3130 Prairie Ave.; cost, $13,000.

W. Sallevasser, two st'y dwell., 109 Fremont St.; cost, $2,500.

W. D. Price, additional story, 117 to 123 State St.; cost, $10,000.

A. Stafford, three-st'y dwell., 101 North Centre Ave.; cost, $8,000.

C. R. Hickok, 2 two-st'y dwells., 3130 to 3132 Vernon Ave.; cost, $6,000.

J. P. McAssey, 2 two-st'y dwells., 480 West Taylor St.; cost, $3,000.

J. L. Campbell, 7 two-st'y dwells., Seeley Ave.; cost, $28,000.

Cincinnati.

BUILDING PERMITS. — Mrs. C. C. Brown, four-st'y brick building, Eighth and Cutter Sts.; cost, $6,500.

E. S. Freeman, three-and-one-half-st'y building, Gest St.; cost, $4,000.

Aug. Roy, two-and-one-half-st'y building, Findlay and Dalton Sts.; cost, $3,000.

Jacob Van Hart, two-st'y building, Melancthon and Central Ave.; cost, $2,200.

S. Richards, two-st'y building, Lincoln and Gilbert Sts.; cost, $16,000; J. H. Mach, builder.

International Panorama Co., two-st'y iron-clad, Seventh and Elm Sts.; cost, $25,000.

Mrs. Bitscher, Findlay and Linn Sts.; cost, $3,000.

Dr. Kaheler, two-st'y frame building, Baltimore Pike; cost, $2,100.

H. Lackman, two-and-one-half-st'y building, Coleman Ave., near Lafayette; cost, $3,500.

Wm. McCammon, Jr., five-st'y building, Race and Elm Sts.; cost, $20,000.

Henry Bosch & Bro. (Henry Thiely), two-st'y frame building, Fargus and Wayne Sts.; cost, $2,500.

Henry Bosen, two-and-one-half-st'y building Vine, and St. Clair Sts.; cost, $2,500.

St. George's Church, addition to two-st'y brick building, Calhoun and Madison Sts.; cost, $5,450.

Geo. Riemeschneider, Highland and Auburn Ave.; cost, $2,200.

J. W. Cotteral, two-st'y building, cost, $3,500.
H. Kracke, addition to two-st'y building, Fifth and Stone Sts.; Jasper & Erchbusch, builders; cost, $2,000.
E. Bechman, three-st'y building, Western Ave. and Findlay St.; cost, $4,500.
H. Fuchs, two-st'y building, 15 Ravine St.; cost, $3,000.
Repairs costing $8,935.
Total amount to date, $1,283,710.
Total permits, 587.

Kansas City, Mo.

Church.—The Cavalry Baptist Society will probably build a $10,000 church.

The Y. M. C. A. Building.—The work of excavation for the new structure has been pushed the past week and the architect is busily engaged in drawing the plans and specifications for the new building.

Building Permits.— H. C. Morrison, brick business block, 1125 Grand Ave.; cost, $4,500.
E. J. Gump, brick dwell., 1330 and 1332 Oak St.; cost, $6,500.
Minos Clark, brick dwell., Washington St.; cost, $7,000.
J. A. Swarthout, frame dwell., Troost Ave.; cost, $4,000.
Eugene Carlat, brick stable, Walnut St., bet. Thirteenth and Fourteenth Sts.; cost, $5,000.
T. H. Brougham, brick dwell., 615 West Sixteenth St.; cost, $3,000.
J. W. Jordan, brick business house, 1422 East Eighteenth St.; cost, $4,000.
H. W. Hatch, brick dwell., 513 and 515 Holmes St.; cost, $4,000.
W. Small, Jr. & A. W. Bristowe, brick dwells., 413 and 417 Oak St.; cost, $15,000.

Minneapolis, Minn.

Building Permits.—Robert Russell, five-st'y brick store building, n e side Fifth St., bet. Hennepin and Nicollet Aves.; cost, $25,000.
Fletcher, Loring & Co., improvements on St. James Hotel, cor. Washington and Second Aves., s; cost, $7,000.
Fletcher, Loring & Co., two st'y brick store and flat, n w s Second Ave., s, bet. Washington Ave. and Second St.; cost, $6,000.
Loring & Windom, four-st'y stone business block, extension of Windom Block, 76' front, Second Ave., s, below Washington Ave.; cost, $35,000.
L. T. Soule Elevator Company, wooden elevator, Tenth St. and Twenty-ninth Ave, s e; cost, $20,000.
Anna Shay, double two-st'y wooden dwell., Marshal Ave., bet. Sixth and Seventh Aves., n e; cost, $2,500.
J. H. Weller, three-st'y brick veneer store, tenement and hall, cor. Franklin St. and Sixteenth Ave., s; cost, $7,000.
J. H. Towsley, two-st'y wooden dwell. and barn, Stevens Ave., bet. Lake and Thirty-first Sts., n w; cost, $4,750.
J. A. Haglin, three-st'y brick dwell., Fourth Ave., bet. Eighth and Ninth Sts.; cost, $6,500.
Minneapolis Bottle Manufacturing Co., one-st'y brick-and-wood factory, e s Thirty-eighth Ave., bet. Twenty-sixth and Twenty-seventh Sts.; s w; cost, $15,000.
James S. Lane, two-st'y wooden dwell., Seventh St., bet. Seventh and Eighth Aves., s e; cost, $3,000.

New York.

Building Permits.—*Broome St.*, n w cor. Lewis St., four-st'y brick tenement with stores, tin roofs; cost, $18,000; owner, John Katt, 314 Monroe St.; architect, J. Kastner.
West Seventy-first St., No. 413, 100' w Ninth Ave., three-st'y brick and brown-stone dwell., tin roof; cost, $18,000; owner, Mrs. Julia A. Bull, Seventy-fifth St., cor. Boulevard; architect, H. J. Hardenbergh; builders, Jno. Banta and H. L. Hamilton.
Boulevard, cor. Tenth Ave., One Hundred and Thirteenth and One Hundred and Twentieth Sts., two-st'y and mansard brick detached asylum, tin and slate roof; cost, about $25,000; owner, Society of N. Y. Hospital; architect, R. Townsend.
Seventy-second St., s s, 175' e Ninth Ave., 4 four-st'y brick and brown-stone dwells., mansard slate and tin roofs; cost, $40,000 and $50,000 each; owner, C. W. Luyster, 237 West Fifty-third St.; architect, J. H. Duncan.
One Hundred and Fifth St., n s, 375' w Tenth Ave., 2 four-st'y Connecticut brown-stone tenements, tin roofs; cost, $25,000; owner and contractor, Donald Mitchel, 176 East Eightieth St.; architect, H. J. Hardenbergh.
West End Ave (Eleventh Ave.), n w cor. Seventy-eighth St., 8 three-st'y brick dwells., slate and tin roofs; cost, each, $9,000; owner, Henry H. Hewett, 411 West Twenty-eighth St.; architect, F. B. White.
Sixth Ave., n w cor. One Hundred and Twenty-third St., two-st'y Ohio stone church and parsonage, slate roof; cost, $80,000; owner, Reformed Low Dutch Church, Harlem, One Hundred and Twenty-third St. and Sixth Ave.; architect, J. R. Thomas; builders, List & Lennon.
Seventh Ave., w s, extending from One Hundred and Twenty-fourth St. to One Hundred and Twenty-fifth St., six-st'y brick family-hotel, tin roof; cost, $150,000; owner, Alva S. Walker, 43 West One Hundred and Thirtieth St.; architect, T. E. Thomson.
New Ave., n w cor. One Hundred and Forty-fifth St., 5 three-st'y frame, brick and tile dwells., shingle, slate, tile or tin roofs; owner, S. M. Milliken, 83 Leonard St.; architect, T. M. Clark.
East One Hundred and Twenty-ninth St., No. 119, four-st'y brick shop, tin roof; cost, $3,000; owner and builder, Thomas Overington, 501 East Forty-second St.; architect, R. Lomas.
Seventh Ave., w s, between One Hundred and Forty-first and One Hundred and Forty-second Sts., two-st'y and attic frame dwell., shingle roof; cost, $5,000; owner, M. Hammerstein, 203 East One Hundred and Fifteenth St.; architect, Alex. I. Finkel.
Seventh Ave., w s, from One Hundred and Forty-fourth to One Hundred and Forty-fifth Sts., one-st'y brick and timber engine repair shop, tin roof; cost, $21,000; owner, etc., Manhattan Railway Co., 71 Broadway.
Eighth Ave., e s, from One Hundred and Forty-fourth to One Hundred and Forty-fifth Sts., and east a distance of 525' from Eighth Ave., five systems (three tracks each) of wood trestle storing car and engines; cost, $35,000; owner, architect and builder, Manhattan R. R. Co., 71 Broadway.
Cypress Ave., s e cor. One Hundred and Forty-ninth St., three-st'y frame tenement, tin roof; cost, $4,800; owner, Lina Dahler, on premises; architect, A. Pfeiffer; builder, not selected.
Washington Ave., No. 1132, four-st'y frame tenement and extension, tin roof; cost, $10,000; owner, Edward Baker, 341 West Twenty-eighth St.; architect, W. W. Gardiner; builders, Wiswell & Gander.
Church St., w s, 150' s Putnam St., two-st'y frame dwell., slate and tin roof; cost, $3,000; owner, Mary A. Norton, Kingsbridge; builder, S. L. Berrian.
One Hundred and Eighty-fourth St., s s, about 100' w Webster Ave., three-st'y frame dwell., shingle roof; cost, $3,000; owner, Peter Handibode, 1432 Franklin Ave.; architect, T. W. Ringrose; builders, P. Handibode and J. Richardson.
North Third Ave., w s, 25' 9" n One Hundred and Fifty-fifth St., four-st'y brick store and tenement, tin roof; cost, $8,000; owner, John D. Thees, 2314 Third Ave.; architect, A. Spence.
Division St., Nos. 136 *and* 138, five-st'y brick tenement, tin roof; cost, $14,000; owner, Fajbush Libman, 18 East Broadway; architect, Wm. Graul.
Henry St., No. 36, five-st'y brick tenement, tin roof; cost, $18,000; owner, Wolf Boroschek, 156 Henry St.; architect, Wm. Graul.
South Fifth Ave., six st'y brick and iron factory, gravel roof; cost, $65,000; owner, W. B. Marvin, 265 Broadway; architect, Oscar S. Teale.
Broadway, n w Howard St., five-st'y brick, iron and stone warehouse, tin roof; cost, $35,000; owner, John S. Rice, et al., 28 West Forty-ninth St.; architects, A. Zucker & Co.
West Fifteenth St., No. 225, five-st'y brick tenement, with extension, tin roof; cost, $17,000; owner, Wm. S. Wright, 36 West Twenty-seventh St.
West Seventeenth St., No. 459, five-st'y brick tenement, tin roof; cost, $14,000; owner, Andrew Ward, 516 Ninth Ave.; architect, J. F. Wilson; builder, Robert Hayes.
West Twenty-eighth St., No. 527, two-st'y brick stable, tin roof; cost, $600; owner, Frank Farrell, 524 West Twenty-ninth St.
East Fortieth St., No. 326, five-st'y brick tenement, tin roof; cost, $12,000; owner, Bridget Golden, 324 East Fortieth St.; architects, A. B. Ogden & Son.

Alterations.—*Liberty St., No.* 41, raised eighteen inches, new brick front, fire-proof stairs, iron beams; cost, $10,000; owner, Leonard J. Carpenter, 56 East Twenty-third St.; architect, H. J. Hardenbergh.
Carmine St., No. 76, raised one-st'y and four-st'y brick extension, tin roof; cost, about $6,500; owner, J. J. Campion, 20 East Tenth St.; architect, M. W. Morris.
East Fourth St., No. 98, repair damage by fire; cost, $4,500; owner, Joseph Schaeffler, 84 Second Ave.; architect, J. Boekell; builders, J. Schaeffler & Son.
East Thirty-ninth St., No. 33, 2 two-st'y brick extensions, tin roofs; cost, $6,000; owner, J. A. Hamilton, 7 East Thirty-fifth St.; architect, C. C. Haight; builder, L. H. Williams.
East Twenty-ninth St., No. 227, five-st'y brick extension, roof raised, front above first story taken down and rebuilt, internal alterations; cost, $5,000; owners, Chas. Dorn and J. Snitzer, 370 Third Ave.; architect, F. S. Barus; builder, not selected.
Bleecker St., Nos. 32, 34 *and* 36, and *Mott St., No.* 311, repair damage by fire and rebuild entirely fire-proof; cost, $85,000; owners, Schumacher & Ettlinger, 33 Bleecker St.; architect, E. E. Raht; builder, not selected.
Thirty-seventh St., s s, 56' 6" w Lexington Ave., four-st'y brick extension, tin roof; cost, $6,000; owner, Jas. C. Fargo, 56 Park Ave.; architect, J. H. Duncan; builders, McKenzie & McPherson.
West Sixteenth St., Nos. 310, 312 *and* 314, raised three stories, peak roof; cost, $10,000; owner, Thos. McMullen & Co., 44 Beaver St.; architect, A. Hatfield.
Madison Ave., Nos. 91 *and* 93, additional story on rear; cost, $4,000; owner, T. A. Emmet, 89 Madison Ave.; architect, T. R. Jackson.
West Twenty-fourth St., No. 20, three-st'y brick extension on front, also two and one-st'y rear extension, tin roofs; cost, $5,000; owner, Henry Hilton, Fourth Ave. and Ninth St.; architect, E. D. Harris; builder, F. Lyons.
Madison Ave., s e cor. Twenty-fourth St., one-st'y brick extension, tin roof, parts of cellar excavated, and new brick piers, etc., built; cost, $30,000; owner, Madison Square Presbyterian Church, on premises; architects, J. C. Cady & Co.; builders, M. Eidlitz & Son and Jeans & Taylor.
One Hundred and Sixty fifth St., s w cor. Twelfth Ave., building raised and moved; cost, $9,000; owner, Institute for Deaf and Dumb, Twelfth Ave., near One Hundred and Sixty-fifth St.; architect, O. P. Hatfield; builders, C. R. Terwilliger and C. N. Brainerd.
Tenth St., n e cor. West Fourth St., raised eighteen inches, one-st'y brick extension, internal, front and rear alterations, iron columns and beams; cost, about $5,000; owners, H. A. & M. Hartman, 46 Clarkson St.; architect, P. H. Gilvarry; builders, G. Derr and C. Lehmann.

Philadelphia.

Building Permits.—*Smedley St.*, s of Venango St., 11 two-st'y dwells., 15' x 42'; J. B. Clarey, contractor.
Greenway Ave., w of Seventy-first St., 2 three-st'y dwells., 16' x 40'; R. H. Parker, owner.
North Juniper St., No. 225, three-st'y dwell., 17' x 54'; G. Thompson, contractor.
Rex Ave., w of Twenty-ninth St., three-st'y dwell., 22' x 30'; W. C. Macker, contractor.
Thirty first St., cor. Springfield Ave., 2 two-st'y dwells., 18' x 65'; contractor, same as last.
Springfield Ave., e of Thirty-first St., 4 three-st'y dwells., 20' x 48'; contractor, same as last.
Harvey St., w of Main St., 9 two-st'y dwells., 15' 6" x 32'; contractor, same as last.
Spruce St., w of Twenty-first St., 2 three-st'y dwells., 20' x 77'; C. W. Budd, owner.
Howard St., n of Norris St., 9 two-st'y dwells., 11' x 37'; W. Tecklenburg, contractor.
Adams St., near Commerce St., 4 two-st'y dwells., 14' x 36'; I. L. Kelly, contractor.
Jasker St., cor. Taylor St., two-st'y factory; Eldredge & Stewart, contractors.
Clarkson Ave., w of Thirteenth St., one-st'y stable; W. R. Dougherty, contractor.
Ashmead St., w of Main St., 6 two-st'y dwells., 15' x 36'; Wm. Garvin, contractor.
Fairhill St., n of Huntingdon St., addition to factory; R. J. Whitside & Son, contractors.
Ontario St., w of Twentieth St., 2 three-st'y dwells., 16' x 56'; Jno. Haverstick, contractor.
Spruce St., w of Forty third St., alteration and two-st'y addition, 20' x 20'; J. R. Garver, contractor.
Dacotah St., w of Thirty-second St., 13 two-st'y dwells., 16' x 40'; W. F. Albright, owner.
Eighth St., between Free and Daley St., 7 two-st'y dwells., 15' x 50'; owner, same as last.
Free St., between Seventh and Eighth Sts., 18 two-st'y dwells., 14' x 40'; owner, same as last.
Mica St., w of Forty-fourth St., two-st'y dwell., 16' x 43'; Jno. Aiken, contractor.
Maud St., w of Twenty-seventh St., 19 two-st'y dwells., 15' x 39'; J. E. Ridgway, contractor.
Marston St., n of Columbia Ave., 3 two-st'y dwells., 15' x 2 ' and 30'; owner, same as last.
Mutter St., s of Lehigh Ave., 6 two-st'y dwells., 12' x 28', C. A. Snyder, owner.
Weber St., Nos. 2110 *and* 2112, one-st'y addition, 17' x 56'; E. H. Flood, contractor.
Diamond St., w of Twenty-first St., two-st'y office, 19' x 28'; contractor, same as last.
Eighth St., s of Lehigh Ave., 9 two-st'y dwells., 15' x 50'; M. L. Heish, owner.

St. Louis.

Building Permits.—Fifty-nine permits have been issued since our last report, thirteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—
Mrs. C. Wohlfurth, two-st'y brick store and dwell.; cost, $3,500; F. J. Capitaine, architect; F. C. Brehme, contractor.
Jos. Roser, two-st'y double brick tenement; cost, $3,400; G. L. Gaber, contractor.
A. Schwalbe, two-st'y brick store and rooms above; cost, $3,000; H. Hofmeier, contractor.
J. A. Lynch, two-st'y brick dwell.; cost, $4,000; F. C. McCormack & Son, contractors.
Wm. Skramker, three-st'y brick store and dwell.; cost, $8,000; C. K. Ramsey, architect.
John Wildermuth, two-st'y brick dwell.; cost, $2,500; J. Wildermuth, contractor.
L. A. Bowlan, two-st'y brick dwell.; cost, $3,300; C. S. Dunn, architect; Jas. Flamory, contractor.
James A. Monks, five-st'y brick store-building, cost, $30,000; J. G. Cairns, architect; sub let.
J. J. Sylvester, two-st'y brick dwell.; cost, $10,000; Jos. W. Givens, contractor.
J. P. Nastime, two-st'y brick dwell.; cost, $5,600; E. Mortimer, architect. J. V. Mayors, contractor.
John Shankey, two-st'y brick dwell.; cost, $2,900; J. B. Legg, architect; P. Brennan, contractor.
Wm. Brandt, 3 adjacent two-st'y brick tenements; cost, $5,000; P. Riechors, contractor.
Mrs. Gallagher, two-st'y brick dwell.; cost, $3,500; A. Beinke & Co., architects; P. Riechors, contractor.
Mrs. C. Bradburn, two-st'y double brick tenement; cost, $3,000; P. J. Bradburn, contractor.
A. Heburn, two-st'y brick dwell.; cost, $2,800; John Low, contractor.
S. Hamaner, two-st'y brick dwell.; cost, $3,000; Paulus & Wiedmüller, contractors.
A. Weinrich, 2 double brick two-st'y tenements; cost, $7,000; A. Dietz, contractor.
Manewal Lange Cracker Co., two-st'y brick warehouse and office; cost, $8,000; Goesse & Remmers, contractors.
Dr. S. G. Moses, two st'y brick store; cost, $9,000; F. D. Lee, architect; B. Weber & Co., contractors.
T. S. Noonan, two-st'y brick dwell.; cost, $3,500; O. McGinnis, contractor.
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T. S. Noonan, two-st'y brick dwell.; cost, $3,500; O. McGinnis, contractor.
C. E. Fuchs, three-st'y brick store and rooms above; cost, $6,000; O. P. Koenig, architect; J. Mariztoff, contractor.
Gen. W. T. Sherman, one-st'y brick dwell.; cost, $2,600; C. Lingermann, contractor.
F. E. Espenshied, two st'y brick dwell.; cost, $4,500; J. H. Dunlap, contractor.

St. Paul.

Building Permits.—Two-st'y frame double dwell., n s of Lincoln Ave., bet. Dale and Oakland Sts.; cost, $3,700; owner, Christopher Kuff.
Two-st'y brick store and dwell., s s of Susan St., bet. State and Greenwood Sts.; cost, $8,000; owner, Peter Rothansen.
Two-st'y brick veneer store and dwell., n w side of Rice St., bet. Iglehart and Tilton Sts.; cost, $3,250; owner, A. W. Schwake.
Two-st'y frame dwell., s s of Fuller St., bet. Arundel and Western Sts.; cost, $2,500; owner, Margaret Carter.
Two-st'y frame college; cost, $4,000; owner, John Ireland.
Three-st'y brick business block, s s of East Seventh St., bet. Robert and Minnesota Sts.; cost, $18,000; owner, M. L. Potter.
Two-st'y frame dwell., e s of Josette St., bet. Martin and Fuller Sts; cost, $2,000; owner, John Lindquist.
Three-st'y brick double dwell., s s of Eleventh St., bet. Cedar and Minnesota Sts.; cost, $9,000; owner, James Cullen
Two-st'y double frame dwell., e s of Wilkin St., bet. Ramsay and Exchange Sts.; cost, $5,000; owner, David Swank.
Two-st'y frame dwell. and barn, e s of Maple St., bet. Sixth and Seventh Sts.; cost, $2,000; owner, Mrs. E. R. Spindle.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 498.

JULY 11, 1885.

Entered at the Post-Office at Boston as second-class matter.

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IN the midst of the discussion which rages at present in this country in regard to the placing of telegraph and telephone wires underground, it is a little startling to learn that a Government Committee, appointed in England to consider the best methods of carrying such wires has just reported decidedly in favor of leading them through the air, instead of underground. It is true that the Committee does not approve of obstructing streets or sidewalks with telegraph poles, but it believes that the best of all places for setting up standards and stringing wires is on the housetops. In reply to the denunciations of this system which have been so prevalent within the past few years, the Committee expresses the opinion that the dangers and inconveniences to be apprehended from it have been greatly exaggerated, and that there is no good reason why wires should not be carried in this way in all directions, with proper care, and under official supervision. Any damage caused by the wires or frames should, of course, be paid for, and the Committee advises that all wires should be so distinguished that the person or corporation responsible for each shall be readily ascertained; and that all lines, the ownership of which is not indicated should be immediately cut down by the inspectors; but in consideration of this it recommends that telegraph and telephone companies should be empowered, in case of the refusal of the owner of a house to allow frames to be placed on his roof, to apply to the local authority for permission to enter by force on the premises, and place whatever frames or wires may be necessary for its purposes, paying to the owner such compensation as the local government might order.

LE GENIE CIVIL describes at length the new floating dome designed by M. Garnier and M. Eiffel, and constructed by the latter, which the banker Bischoffsheim has just presented to the Observatory of Nice. The history of the building of this dome is interesting. Some ten years ago, M. Bischoffsheim, who has been a most generous friend to science, gave to the Observatory of Paris a large meridian circle, which has been used ever since in making interesting and delicate observations. Among the incidental observations which were made with it, however, happened to be some which showed that the Observatory building was subject to continual movements of various kinds, tending, however, in the direction of a gradual settlement of the whole structure. These irregular motions, which were first disclosed by the great circle, must obviously affect the accuracy of observations made with instruments, the very principle of which depends upon the absolutely vertical or horizontal position of some part of them; and, apart from matters of this kind, any deviation from a horizontal plane of the base of the movable dome which usually crowns observatories, gives rise to difficulties in moving the dome, which must then roll partly uphill on its cannon-ball supports, and with much more hindrance from friction than when in its normal position. For example, the present dome of the Paris Observatory, although not very large, being only forty feet in diameter, needs several men to move it, and even then requires forty-five minutes to make one turn. This is far too slow work for an astronomer, bent upon making as many observations as possible in the few nights clear and still enough for using a large telescope; and a gas-engine is now used in Paris, which drives the dome around in ten minutes. Even this is slow, and the Government Directors of the Observatory, finding themselves likely to be deprived, on this account, of much of the advantage which they hoped to derive from their fifty-foot equatorial telescope, invited designs, about four years ago, for a movable dome on some improved principle. Seven projects were presented, of which one, placed second in the award of prizes, on account of the hazardous novelty of the principle on which it was based, was by M. Eiffel, the distinguished designer of the Douro and Garabit viaducts, and proposed a dome of sheet-iron, furnished with a circular box at the bottom, which floated in a tank of corresponding shape, filled either with water or some liquid not subject to freezing or evaporation.

NATURALLY, this startling departure from the ancient precedents occasioned much discussion, some critics claiming that the floating part of the dome could not be repaired without great difficulty, and others representing that the lateral movements caused by the wind would interfere with the accuracy of the revolutions. It is hardly necessary to say that M. Eiffel found no difficulty in replying to these criticisms, and his plan was warmly favored by Admiral Mouchez, a scientific man of the highest reputation, and by M. Garnier, who interested himself greatly in the matter, and suggested several modifications. M. Bischoffsheim was also pleased with the plan, and as the Government officials still hesitated to adopt it, he applied to M. Eiffel to carry it into execution at once on a large scale, with the coöperation of M. Garnier, for the new observatory which he was building at Nice. The principle modification, suggested by M. Garnier and afterwards adopted, consisted in furnishing the dome with rollers, running on circular tracks outside of the tank in which the cylindrical foot floated, arranged in such a way that the weight could be either sustained entirely by floating or lowered in any desired degree upon the rollers, in order to secure lateral stability, as well as the means of operating the dome in case of repairs to the tank, and additional resistance to any displacement by the wind was provided by arranging horizontal rollers, fixed upon the immovable substructure, within which the dome revolved, just touching them all.

WITH these improvements the dome was constructed as designed, but with dimensions much greater than those specified for the Paris dome, the diameter of the movable hemisphere being eighty-four feet, and its weight about sixty-five tons. The skeleton of the dome is formed by two large semi-circular lattice ribs, placed parallel to each other, and ten feet apart, and fourteen other ribs, placed radially. Fourteen smaller ribs subdivide the lower portion of the spaces between the others, and the whole is tied with horizontal bands and wind-braces, and covered, with the exception of the trap for observations, with rolled steel plates riveted together. The trap for observations, a very necessary part of such a dome, occupies the space between the two great parallel ribs on one side of the hemisphere, extending from the base to the summit, so that every part of the sky is at the command of the observer. The common mode of closing such traps is by means of shutters, arranged to slide one over the other; but for a dome so large, and with so wide an opening, such shutters would be so heavy as to be almost unmanageable, and the trap is provided instead with two long, curved shutters, which roll laterally on tracks fixed to the exterior surface of the dome, in such a way that they can be drawn together, either wholly or partially, over the trap, making a weather-tight covering. These shutters weigh three and one-half tons each, but can be opened or closed in three-quarters of a minute, by means of a winch placed in a convenient position. The movement of the dome itself is, in proportion to its weight, still more easily regulated. By actual test, a pressure of six pounds on the dome is sufficient to start it from a position of rest, and keep it moving with constantly accelerating motion. In practice, a windlass on the floor of the observatory is employed to turn the dome, and the friction of this, and of the endless chain by

which the effort is transmitted to the dome, add something to the outlay of power necessary; but a steady pressure of seven and one-half pounds on the handle of the windlass will turn the great dome, only a little smaller than that of the Capitol at Washington, entirely around in three minutes. The liquid in which the dome floats is a solution of chloride of magnesium.

THE English Government, as well as the public generally, has suffered a serious loss in the destruction by fire of the Indian Department of the Inventions Exhibition in London. The name of Inventions has in this particular exhibition been extended to cover a great variety of objects, and an immense number of costly and beautiful articles had been lent to the managers by the South Kensington Museum, and were totally destroyed. The special collection gathered by the Prince of Wales in India, although exhibited with the rest, was saved, but most of these things were of comparatively modern workmanship, and possessed much less interest than the masterpieces of barbaric luxury, which had been brought home by the earlier English colonists or invaders, and were stored at South Kensington. The fire is said to have caught from an overheated flue in contact with the wood-work of a cheap restaurant, and as the articles destroyed, however well insured, can never be replaced or duplicated, it may be hoped that the occurrence will serve as a warning to the owners of valuable property not to trust it in places where such combinations of flues and cheap wood-work are possible.

PEOPLE who have a taste for ghosts and historical associations, and have money enough to gratify that taste, can do so very effectively at present in England by buying and occupying one of the ancient castles now offered for sale. The depression of business, and still more, perhaps, the depression of agriculture in Great Britain, has, according to the *Builder*, brought an unusual number of historical estates into the market, and with them all the associations, as well as substantial privileges, which belong in England, much more than in any other country, to the possessor of landed property. Among others, the Castle of Fyvie, in Scotland, where King Edward the First, of England, spent a night five hundred and eighty years ago, is offered for sale. This castle has been held successively by the Lindsays, Prestons, Setons and Gordons, some of whom have been nobles and some simple gentlemen, but nearly all distinguished in some way; and the place is redolent of reminiscences. The worst of these reminiscences are supposed to be associated with a mysterious room, known as the "Chamber of Horrors," which is walled up, and is further defended by a tradition that if it is ever opened, trouble will come upon the family which holds the estate. In England, the famous ruins of Guilford Castle are for sale, with the estate to which it belongs. The purchaser would have some trouble in making the castle inhabitable, but it is at least defensible, having a central tower, or keep, seven hundred years old, and seventy feet high, with walls ten feet thick. So far as the dignity of its possessors goes, Guilford surpasses the Scotch estate, having been the property of the Crown, and occasionally the residence of the king, until about two hundred and fifty years ago, when it was bestowed upon an earl, whose successors and descendants have kept it until now.

A RECENT decision in England has added something to the common law in respect to the responsibility of servants, which is well worth remembering. According to the *Builder*, the Corporation of Liverpool has for some time employed a certain contractor to furnish men and horses for working the city watering-carts, paying him for the use of them, but leaving to him the care of paying the men individually. The city, however, furnished an inspector, who superintended the watering of the streets, and directed the drivers where to go. One day a watering-cart, by some neglect on the part of the driver, ran into a carriage and injured it, and the owner of the carriage brought suit against the city for compensation for his loss. The first court before which the suit was brought decided the Corporation was liable for the consequences of the driver's carelessness; but on appeal to the Queen's Bench Division, the judges reversed the previous decision, holding that the Corporation was not liable. The *Builder* supposes that the principle on which this judgment was based is the same as that adduced in a similar case some time ago, which was explained to be that the person who chooses the servant, and has the power of dismissing him is the one who is responsible for his misdeeds; not the person who has temporary authority to give him directions. This is clear enough; but it would be interesting to know how far the principle would be modified if the agreement between the city of Liverpool, for instance, and the contractor, had contained a clause, as such agreements often do, to the effect that the agents of the Corporation should be at liberty at any time to discharge men who appeared incompetent or unruly.

THE *British Architect* mentions a recent auction sale in London of pictures, in water-color and oil, which has some interest. Among the water-colors was one by Samuel Prout, whom architects take a just pride in claiming as the best sketcher of architectural subjects that ever lived, and whose works ought to be accessible as models to all draughtsmen. The subject was a view in Milan, and the price paid for it was four hundred and eighty guineas, or twenty-five hundred dollars. This is a large price for a water-color drawing, and would seem larger still if another one, by De Wint, had not been sold at the same time for the enormous sum of nine hundred and sixty guineas, or a little over five thousand dollars. A water-color sketch by J. M. W. Turner, was sold for two hundred and fifty guineas, which seems a small price, considering the exaggerated reputation which his works have enjoyed since Mr. Ruskin took it into his head to "write up" his drawing-master, but it may have been a small, hasty scrawl, like so many others of his. Among the pictures in oil, were several by Dante G. Rosetti, who certainly had a happy faculty of choosing names for his pictures, whatever one may say about his rendering of the subjects. The highest price among these was brought by one called "La Bella Mano," which sold for eight hundred and fifteen guineas, and the next by "Venus Verticordia," which brought five hundred and sixty guineas, or nearly three thousand dollars. Only one picture by the recreant member of the Pre-Raphelite Brotherhood, Millais, was sold with those of his former chief. This was a portrait of Carlyle, which must have been either a poor picture or a poor portrait, since it brought only a little over twenty-five hundred dollars; while several feebly-named pictures by Burne-Jones, were sold at prices varying from this to three thousand dollars.

M. EDOUARD MARIETTA gives, in *Le Génie Civil*, a description of the new post-office in Paris, which, although not a very large building, is fitted with appliances for carrying on a large amount of business in the most rapid and convenient way. Every one knows that the Parisians use the mails very freely, and it is said that more than seven hundred millions of letters, newspapers and other objects now pass through the Paris office every year. The division of the matter, and of the different services which occupy the new building, is much the same as in other post-offices, although, as the Parisians have been accustomed to depend wholly on local delivery, the space allotted to boxes, which are introduced for the first time, is very small compared with that needed in the New York or London post-offices. The public portion of the building comprises an open portico, with a janitor's office at one end, and an information office at the other, connected with which is a public telephone-office, containing four instruments. The portico opens into a large hall, around which are thirty openings for the sale of stamps, the issue and payment of money-orders, the reception of letters, and so on, together with several telegraph-offices. Adjoining this is the "*poste restante*," or delivery-room, which has a separate entrance from the outside. This completes the public portion. The administration-rooms comprise the usual sorting and stamping rooms, with lifts, chutes for letters and packages, and conveniences for delivery and reception of mails, among which is to be counted a stable for one hundred horses, as a supplement to the private accommodations of the contractors who transport the mails through the city. There is a certain novelty in the shape of the tubes through which the letters are dropped from the upper to the lower rooms. It is found that in high buildings the letters and packages dropped through vertical shafts suffer contusions of the corners and abrasions of the surface, which it is desirable to avoid, and to obviate these inconveniences the Paris tubes are made in the shape of a corkscrew. Two of them, twisting about each other like amiable snakes, ascend in each shaft, so that they take much less room than would be occupied by inclined planes, and the interior surface being of oak, well polished, the letters descend smoothly and safely.

THE SOURCES OF SYMPATHY BETWEEN ARCHITECTURE AND SCULPTURE.



THERE is an obvious and natural fellowship as among all the fine arts, so most obviously and naturally between sculpture and architecture. The architect deals to a great extent with the same solid materials as the sculptor. The chisel and the mallet are active in the service of both, in compelling stubborn material to assume forms expressive in whatever different ways of grace and propriety, of dignity and beauty. The sculptor must be beholden to the architect if any of his works, except those which are designed to stand free in the open air, have an opportunity for fair display; if all the best refinements of his art are really to be visible, not shrouded in darkness or obliterated by glare. On the other hand, the noblest enrichment of even external architecture is obtained by association with sculptured models of living form, human or merely animal, or pertaining to the vegetable world, and treated in whatever style, from the ennobled to the fantastic, from the simplest adherence to nature to the wildly imaginative or conventional decoration.

If any lesson may be learned by the architect from the practice and principles of sculpture, it may well lie in the appreciation of the value of harmonious and graceful outline, of silhouette. The connoisseur who derives most enjoyment from sculpture is of all others best aware of the importance of the command of most favorable general outline, and ever seeks and seizes upon it most infallibly. Freedom and purity of bounding outline characterize all the finest statues which we have received from antiquity. In some examples these qualities become manifest from various points of view, though one among them is ever incomparably supreme. The group of wrestlers at Florence, the Lottatori, is a remarkable achievement in this respect. View it from almost whatever point we will, the complicated action explains itself, and the lines fall into admirable composition. Scarcely less can be said of the Medicean Venus; but there are certain statues which are not the less of the highest class because they are open, it may be, but to a single favorable aspect.

The Venus of Melos, transcendently beautiful from one point of view, is little less than intolerable from one or two others, indeed, from almost any other. This was of the less consequence as the statue was manifestly set up where it could not easily be seen obliquely, and not at all from behind. The prototype of the Medicean Venus was, as we learn from Lucian, erected in a building which purposely admitted of various aspects. Pausanias states that Phidias himself marked on the pavement of the Olympian temple the place from which he wished his great masterwork of Olympian Zeus to be contemplated. But in the absence of such guidance, there are constantly details of management in the statues themselves which are helpful to the same effect. The sculpors had stratagems by which a false aspect was made gratuitously unattractive; and so it is that we find ourselves yielding even unconsciously to compulsion, till we gain the intended place. The Venus of Melos supplies an apt illustration of this calculated adjustment. If we take our stand considerably to the right of the goddess, a protruding "knob" of her hair breaks, very unpleasantly, the clear outline of her neck. Even those who do not distinctly recognize the warning are induced by it to move away from a position of which it does not constitute the worst disadvantage. If we care to linger in it, we must do violence to our better judgment if we are not offended by the apparent unequal lengths of the goddess's legs, and also by the not engaging profile of her face. We move gradually away to our own right until the intrusive "knob" vanishes behind the outline of the neck, and at that moment all the lines of the statue seem to fall into harmony, as naturally as when a landscape seen through a telescope is brought by adjustment into accurate focus. The same trick, if so unceremonious a word may be allowed when goddesses are in question, is observable in the Diana of Versailles. In the case of male statues, the best aspect will always be found insisted upon from a position which allows the eye to travel down a continuous outline from flank to thigh, without interruption by the emergence into sight of the glutæus muscle beyond.

Now as regards architecture, we have a right to expect analogous gratification in following the general comprising lines of any structure which has pretensions to importance and character. Here, also, there should be inducement for the spectator to linger involuntarily at certain positions of chief interest; he will hardly do so unless his attention is detained by the delight of travelling from part to part with perfect exemption from a sense of abrupt disconnection or jar. Discontinuousness of outline is never more unpleasing than in such an instance as a spire emerging from behind a portico, whatever the beauty of the spire in itself. Some rational and easily apprehended relation of superstructure to ground plan and its leading lines is all-important. In buildings of pretensions far inferior to the national, municipal or ecclesiastical, all architectural charm is liable to be vitiated by a confused or vulgarized sky-line. May the day be near at hand when a practicable solution shall be found for the problem of heating dwelling-houses without the necessity of ejecting coal-smoke into the upper air. Architects will then be relieved from the task of contriving how conduits of foulness may be made inconsistently picturesque, or still more inconsistently dignified, with the consciousness that after all they are only preparing a field for the profanations of the smoke-doctors.

And the value of beautiful general outline is not the only lesson which the architect may learn from the sculptor and the sculptor's special model. The combinations which are involved in the perfect human organism have been recognized, since the days of the ancients, as constituting the noblest type of the same problem, and that admirably solved, which is presented to the skill and genius of the architect. Organs of marvelous variety of form and function are disposed unsymmetrically in a manner to promote harmonious coöperation, and yet consistently with concealment within a symmetrical exterior. We have here no such parallels to the constructional makeshifts which too often do violence to our sense of propriety as well as to our convenience, yet are forced upon us and have to be submitted to, in dwellings and offices. A window which appears single without is divided in the interior from top to bottom between two apartments; or still worse, it is divided horizontally, and the half which lights an upper floor lights it, so far as it may, from the level of the floor; or a cornice, which is necessary for the completion of an external order, has such projection that it cuts off all the view of a garden below from a first-class bedroom. If these are architectural necessities, we groan none the less, and those who impose them will search in vain to find precedents where Nature has been driven to a compromise so humiliating. Nature again sets before us an example in the human limbs — as indeed in the limbs of all other animals, though most perfectly in the human — of that harmonious effect which results from contrasted yet coöperating energies being provided for by differentiation of identical elements. The functions of the arms and hands are to pull or grasp, and those of the legs and feet to push and press; yet they answer to each other bone for bone, and in respect of magnitude are controlled by governing limits of proportion, each to each. Here, if anywhere, the architect may con the lesson of penetrating by study on the one hand to the fundamental analogies of members of his composition — as, for instance, of door and window — and the recognition, on the other, of the special characteristics which claim to be superinduced, and which it remains for imagination or invention to gracefully supply.

A triumph indeed it is when art can in any degree vie with Nature in such a union of economy of primary elements with fertility of resource in adaptation. Fine art is bound to be decided, characteristic, specific, and when a sculptor would evolve the full effect of expressiveness of the human form, he superinduces upon characteristic form characteristic action; he exhibits character characteristically swayed by passion or purpose, by emotion or sentiment. This is technically motive — motive justly so named, as it disarranges the primary plain, symmetrical arrangement of parts and members, with reference to some particular influence or design. Subtlying symmetry is recognizable still; it continues to be at once a controlling and directing power, and only acquires concentration under excitement, as if responsive to the predominance which is given to the right hand and right side of the organism, relatively to the left, under the influence of energetic action.

It may seem rather desperate to intimate the possibility of an analogy as applicable here, among the rigid forms of architecture. Can we, it may be said, venture to disturb bilateral symmetry in buildings of any importance, without forfeiting its value? This is partly a question of degree. To take the simplest illustration, the symmetry of the garden-front of a mansion need not be vitiated, though the plain window of a library or billiard-room at one end is replaced at the other by the bay-window appropriate to the lady's morning-room or drawing-room. Otherwise, a main symmetry would not be vitiated by distinctly subordinate adjuncts on one side or the other; nay, it may be questioned whether in the case of the cathedrals, which are often, and usually indeed, so strictly symmetrical, a certain advantage is not occasionally apparent from the towers not being absolutely on a par in elaborate ornament or dignity. At the same time so important is it in architecture that no irregularity should be capable of impairing its prime characteristics of solidity, stability and repose, that only the nicest sense of propriety can decide how far the reins of discipline can be relaxed — at what precise point the advantage is secured of release from rigorous pedantry in details and security from that lapse into disorder which is fatal to unity of effect.

It seems to have been a familiar and favorite maxim with the ancients of certain periods, that the columns of the several Orders of architecture were even in some manner derived from the proportions of the developed man, the matron, the maiden, and so forth. Such a comparison is fair enough, so long as it is kept within the bounds of analogy and not pressed to definite agreement in special details, as when the closer flutes of the Corinthian or Ionic were supposed to copy the vertical folds of feminine dress. But a closer and more instructive comparison may be instituted between the adaptations of the human form to those circumstances of external environment which are common to it — to the body we live in, with the structures in which the body has to live. These have their most concentrated expression in the configuration of the human visage. It is here that the most delicate organs ministrant to sensation are assembled and are of necessity exposed to "the skiey influences," to the impact of weather and glare of sunlight. There is, in consequence, something more than mere fantastic analogy between the profile of the face and

that of a combination of the essential elements of a structure contrived to protect inmates, and to be capable of self-protection against sun and wind and downfall of rain. Fine draughtsmanship is as important for the architect as mastery of all the refinements of curvature for the sculptor. It is by appreciation of the forms and of the propriety and significance of the forms of the human figure and the human face especially, that refinement and truthfulness of outline will be most certainly achieved by either artist.

When Socrates, according to the report of Xenophon, was arguing with a certain Aristodemus, that it was but reasonable to refer the adaptations of Nature which have reference to intelligible purposes, to an intelligent cause, he instanced the protection afforded to that tender organ the eye. Besides the lid which closes over it spontaneously in sleep, and the lashes which intercept flying dust, he drew attention to the service of the eyebrow, which, cornice-like, stays or diverts the perspiration which comes down from the forehead. This protection of the inset eye by brow and eyebrow is a repetition of that afforded to head and brow itself by the hair; again below, the orifices of the nose are protected by the covering wings of the nostril; below these again the mouth is protected from offence by the slight upward curve of the lip and its projection, slight as this is, beyond the under lip. The moustache indeed here performs the same functious as the eyebrow above, and the downflow of the beard from cheek and chin protects the throat.

Those who will pass from the study of the delicate curves and degrees of projection of the several features of the profile of a well-preserved and fine Greek statue will be best prepared to appreciate the refinement of the profile of the order of the Parthenon. The minutely accurate plates of Penrose's "*Principles of Athenian Architecture*" enable us to appreciate within what narrow limits of dimension expression could attain its acme. In an architectural profile we may theoretically regard all projections beyond a plain face or a vertical line as mouldings. The attainment of appropriateness and delicacy in these marks an epoch of culmination both in Greek and Gothic architecture. And in both it is no over-refinement to say that this achievement was coincident with and mainly dependent on appreciation of the form and function of the drip-moulding or *larmier;* that is, of an edge of a certain projection, and so undercut or throated that water cannot draw back along its under side, but must needs fall clear of the retired surface. Most pronounced examples are given by hood-mouldings of Gothic windows, and the so-called bird's-beak moulding of the Greek cornice. The Greek cornice is itself so boldly undercut as to protect the face of the entablature; the bird's-beak moulding in turn protects the face of the cornice. We have only to pass our eyes over any of the historical series of examples of Norman mouldings, to observe how very gradually and occasionally the indispensable function of this moulding was recognized, and then with what avidity it was seized on by the Early-English architects. In their hands it proved susceptible of an extraordinary variety of developments and combinations, and among these, many which as in Greek architecture were adopted for the sake of beauty in situations where it was without justification on the score of usefulness. It is applied to the capital of an anta of the Parthenon, at the back of a deep portico, as it reappears and is repeated among the mouldings of the pier arches of a cathedral. There is something in this emphasizing of the principle of shelter which harmonizes with the transition of society from rude indifference to the inclemencies of weather to a state of tenderer sensibilities and milder and more careful manners.

It is needless to insist that we are concerned here with analogies, not parallels. The profile of an order is something very different to that of a face, but it is dominated by like conditions. A façade crowned by a bold cornice but with windows destitute of mouldings, shocks us like a face without the ornament of eyebrows. Equally offensive is such an exaggeration of the pedimental or segmental mouldings over windows that they exceed the projection of the main cornice above. And a cornice which has a projection out of all proportion to that of the mouldings which it is responsible for protecting is repulsive after a fashion which, if analyzed, will be found to owe much to associations with human deformity.

W. Watkiss Lloyd.

THE BERLIN COLLECTIONS.[1] — II.

Berlin, 1885.



Romanesque Capital. German. 12th Cen.

The next step from the picture-galleries is, of course, to the print collection; and, however time may press, every visitor to Berlin will make a point of here seeing at least the last great acquisition, that which almost wrung tears from all English amateurs — the manuscripts from the Hamilton sale. I will not delay over the splendid illuminated missals, all, apparently, in perfect preservation. I will only give a word to the pearl of greatest price — the Botticelli Dante. A few of its leaves are displayed under glass. The others, making, I think, eighty-four in all, are carefully mounted so that both sides show, and are kept in locked portfolios which, however, are willingly opened and intrusted to the hands of any enquirer. When one remembers for how many years they were all but lost to the world, and notes the spots and stains of dampness and the perforations which seem to tell of the undisturbed admiration of non-human book-worms, one rejoices at their present safety and publicity. And when one puts the Berlin print-room, with its wide, well-lighted apartments, and its broad tables and unlimited elbow-room inviting to leisurely enjoyment, in contrast to the crowded cavern known as the print-room of the British Museum, one cannot even regret that they were brought across the Channel. And yet how strange it seems that just in these years when Mr. Ruskin has been preaching the gospel of Botticelli with such insistence, when Mr. Burne-Jones has been producing a nineteenth-century pseudo-version of its charm, and when the Botticelli cult seems absolutely to have moulded the cheeks and chins of young feminine England into a likeness with its own ideals, this unique example of the master's art should have been let go forever from English keeping.

The drawings are all executed on folio sheets of parchment, the long side forming the base; and the text is very simply written in the same direction and in four columns on the reverse side. When placed in order, each drawing illustrates the text of the following sheet — that is, of the page opposite to itself. One of the Inferno series is fully colored in rather heavy tones, the dark brown of the demons contrasting sharply with the light flesh-tints of the human souls. All the others are in outline pen-and-ink, with the exception of a few which are incomplete, in which the first faint intention of the point has not been gone over with the pen. They are illustrative drawings in the simplest sense — not planned with an eye either to decorative or to strictly pictorial effect. Certain pages show but a single incident, but in the majority we have many moments joined together in the naïve early way, Dante and his companion being repeated over and over again in the successive steps of their wanderings, yet the whole forming but a single composition. The figures vary in size from less than a couple of inches to a span's length, but the most are perhaps three inches in height. And in the artistic value of the pages there is also much diversity; it is not hard to see which subjects interested the artist most — over which he passed with comparative carelessness, and upon which he dwelt with loving care, elaborating them with a draughtsmanship that is consummately complete and perfect yet extremely free and spirited. Much dramatic power and imaginative emotion is shown in the Inferno and Purgatorio series; but Botticelli as we know him in his paintings — Botticelli with his strangely intense feminine type, his peculiar phase of sentiment, and his love of drifting motion — shows most clearly in the Paradiso drawings, and most triumphantly, I think, in those pages where he gives us the figure of Beatrice on rather a large scale. The intensity of the effect he sometimes produces — as where he shows us the Circles of Paradise, for instance — is not more remarkable than the beauty of his result, and almost less remarkable than the extreme simplicity of his artistic method. Fortunately, for all lovers of art, and especially for the lovers of that which is peculiar, I may say unique, among the relics of the art of other days, these drawings are now being reproduced by some photographic process. They will hold a place by themselves in the collector's cabinet. There is little else save a few isolated drawings of the same period, with which in external form they have affinity. And there is certainly very little in the subsequent history of art with which they have any spiritual affinity. They make one think sometimes of Blake (in their spirit only, I mean, not in their form), but certainly not of any other artist much later than their own creator.

Turning to the Berlin collections of sculpture one must begin, of course, with the greatest acquisition they have ever made, the Pergamon marbles. Theirs was truly, as the Germans say, an "epoch-making" discovery — epoch-making for Berlin, as it raised the museum to the rank of the greatest, giving it a treasure not only splendid in quantity and quality, but absolutely new in kind; and (since this last is true) epoch-making, also, for the world at large. Unfortunately, the Museum has no space in which to exhibit them all at their best. The majority are placed upon the ground in a slightly inclined position along both sides of a long room where even the light is not all that could be wished. But the finest groups of the larger and the smaller frieze are admirably shown around the great rotunda, mounted on backgrounds colored into keeping with their own grey tone, but themselves, of course, undefiled by any so-called restorations. A marvellous amount of patient skill has been used in placing the smaller dissevered fragments as far as possible in their proper relations to the larger masses; but no tinkering has been done even with frankly-displayed plaster. When restorations are essayed in a properly-conducted museum, they are essayed in entire casts, not by the use of original fragments.

The condition and the character of these remains have often enough been described. I will only record my own experience that the mutilation of the great frieze, deplorable though it is, is far less fatal to the effect of its main groups than I had supposed. And also that no verbal or photographic pictures at all prepare one for the tremendous impression made by the colossal originals — take away at all from the freshness with which one feels their passionate power and beauty, or from the exciting sense with which one realizes that here is not only something admirable, but something absolutely *novel*, something quite unlike all the plastic art we had ever known, yet triumphantly vindicative of its own plastic rightness. These marbles

[1] Continued from No. 496, page 309.

do something much more interesting than enlarge our catalogues and deepen a knowledge we had already had. They enlarge our whole artistic horizon and give us a new knowledge of the sculptor's possibilities, paths, and goals. This being so, is it treason, is it barbarism, to say that perhaps we owe a greater debt of gratitude to the German explorers than though they had unearthed for us a new series from the hand of Phidias himself? It does not so seem to me, especially as I cannot but feel that these Pergamon sculptures come nearer to the modern heart than do the relics of the greatest age of Greece, and therefore may possibly have some direct influence on the sculpture of the future. Nearer to the modern heart, I say. I am not speaking of the purely æsthetic sense — of the judgment of eye and mind, of the realization of the noblest possible physical, intellectual, or spiritual ideals. I am speaking of the inborn emotional nature of modern men. This we may imaginatively cast off when delight or theoretic knowledge is our end, but we cannot cast it off when *production* is in question. Or more, truly, we can, but at the sacrifice of all vitality and of all but a cold, superficial worth in our results. And the emotional nature of the modern world, I repeat, seems to me more akin to that which expresses itself at Pergamon then to that which expresses itself at Athens. Magnificent, awe-inspiring though they are, these passionate creations do not, like the serene Parthenon creations, seem quite hopelessly out of reach of mortal rivalry, enthroned on an absolutely unapproachable Olympian height. They are super-human, truly, but they are not quite divine. It is possible for one to conceive of their spirit being again incarnated, and in a modern shape. But I do not think it is possible to conceive this of the spirit of Phidias, not as the world is to-day. If these things are true, does it not seem as though the Pergamon relics might indeed be the very best gift which the ancient world could have yielded up to us? Does it not seem as though they may prove a mine of wealth in a very literal sense — that from them may come an inspiration and a lesson which may make the art of the twentieth century something different from what it would have been had they slept on in the city of Attalus?

The smaller frieze from the great altar is interesting, as showing a treatment of the relief which admits landscape and other backgrounds and figures on a second plane — a treatment, used of course, by the Assyrians and the Romans, but not by the Athenians of the great age. Fragments of the temple of Athene Polias, which stood on the extreme height of the Acropolis, above the platform occupied by the altar, are also to be seen in the museum, among them a Doric column from the lower and an Ionic column from the upper story of the exterior, and decorative reliefs bearing tropies of arms and military implements, which filled the intercolumniations in the latter, and which offer valuable evidence as to current military fashions. Still more interesting, I should say, considering its site and its companions, is a slender column which formed one of the interior supports of this same temple. It has a deep palm-leaf capital of purely Egyptian type, a type absolutely identical, for instance, with one found at Sesebi in Nubia, and illustrated by Lepsius and Perrot. Statues of more or less importance and of different epochs have been brought to light in and about the temple, among them a *standing* hermaphrodite, and one of the rare representations we know of the Jupiter Ammon. Among the inscriptions is one which, considering its present resting-place, cannot but be called a great curiosity. It was set up by the citizens of Pergamos in honor of that Quintilius Varus who was a Roman functionary in the East ere he faced Hermann in the Teutoburger forest. Certainly, the Germans seem destined to triumph over their enemies in retrospective, as well as in other, ways!

I must not delay over the other newly-won Greek sculptures of the Berlin Museum, not even over the beautiful Attic reliefs of the former Saburoff collection. Nor must I attempt to describe the rooms devoted to the minor relics of Greece and Rome — bronzes, vases, glass, terra-cotta; to the remains of Egypt and Assyria — these less rich, of course, than those at Paris and at London; to the Central American and to the North European antiquities. Among the very latest acquisitions are casts and a few genuine fragments from the recent Syrian explorations.

The mention of casts suggests the fact that of these Berlin possesses a richer and more representative collection than elsewhere can be found. But the reflection, also, that in this enviable possession there is no real occasion for our envy, since it depends only upon our own apathy how long we shall remain without the like. A really representative collection of the pictorial art of other days we can never hope for, though it makes one sick with regret to remember that we might have begun when London and Berlin began, and perchance outbidden both, and that even the gleanings which still remain in no despicable quantity (as the history of the last fifteen years in Berlin so clearly shows) are being hourly snatched away from under our unappreciative eyes. Nor can pictorial art be profitably reproduced by any copyist. But plastic art *can* thus be reproduced, and in a way which for its most essential qualities — those of form, not of color or of delicate surface treatment — equals the original effort. Indeed, a full museum of casts not only all but supplants the need for a sight of its originals, but is now recognized as a necessity, even for students who have seen these originals in their widely-scattered homes, supplying an opportunity for comparison and consecutive study which is quite essential to accurate knowledge. And the expense of forming such an one is comparatively very small. Why, indeed, have we not yet gone about it in earnest? Why has Boston but a fragmentary beginning, and New York not even this, when every large town in America might and ought to have a collection completer even than that in Berlin?

If one needed to be converted to a belief in the beauty and utility of these reproductions, he could not do better than view the Olympia series in Berlin, which for want of room is not included in the main collection, but has been relegated to the Campo Santo of the cathedral near by. Here among very many minor relics one sees the Hermes of Praxiteles, the Niké of Paionios, and the great pediment groups, all shown both in their mutilated condition and in tentative restorations. Again our ideas with regard to ancient sculpture gain a distinct enlargement, although we cannot say that a new kind of *perfection* is revealed as it is in the Pergamon frieze. A large part of the fresh knowledge we gain lies rather in the opposite direction; proves that what we once deemed *Greek* perfection was, in truth, but *Athenian* perfection of the Periclean age. The exact date of the pediment sculptures has not been fixed; but the temple was not finished until B.C., 450, so at the most they cannot have preceded Phidias's pediments by more than a dozen years. Yet an infinitude of distance seems to stretch between them; as compared with the Athenian, the Olympian works are distinctly undeveloped and tentative alike in their composition and in their execution. And, furthermore, they do not seem only and merely undeveloped, tentative, when placed in this comparison. They seem *different* in their very essence, — we feel they would have been essentially different even had their technical perfection been as great. They strike a distinct new note of their own in that chorus of Greek art which, we are yearly learning, was an infinitely more diversified art than its worshipers once believed. Their spirit, their emotional character is quite their own — as distinct from the stony, smiling impassiveness of Egina as from the animated yet supremely reposeful divinity of Athens, or the superhuman passion of Permon. Perhaps I may use a bad word for want of a better, and say that it is more *realistic* than the spirit of either earlier or later work, holding a stage which often comes between archaic conventionality and perfected idealism. Not only in the facial type of some of its actors, which have an almost savage character it seems strange to associate with their land and time; but in composition and action too the western pediment called of Paionios (which is much better preserved than the other), seems almost crudely human. But its humanity has a primeval, fierce intensity which is extremely powerful, and has, moreover, a strange fascination of its own. I do not know just how much credit is now given in the highest critical circles to the hypothesis that they were executed by comparatively unskilled workmen after mere designs by a master. But to the unlearned (at least to myself as one among these), the fact seems not essentially unlikely; their intention seeming so much greater than their technical expression. I do not think one has just the same sensation before true transitional work like that of Egina, for example.

The beautiful Niké is indisputably from the hand of Paionios, and is again a revelation. One would hardly have expected a classic sculptor to seek in a statue of this size the very incarnation of that swift *motion* which theorists tell us lies without the plastic field; but Paionios sought it here, and with astonishing success. And yet the theorists are not entirely put to shame. For forcible, and beautiful and eminently successful in the desired expression though his result certainly is, it is not perfect in its beauty; and its imperfections are the direct sequence of the subject chosen — this we find what we once would not have believed — both that Greek sculptors did so-called "illegitimate" things, and also that their products were not always flawless even when the artist was flawless in technical power. Have not indeed the varying voices of Pergamon, of Olympia, and Tanagra quite revolutionized the world's traditional ideas with regard to classic art? And in each case to hear the new voice as distinctly as possible, we must hear it in Berlin.

The Berlin Museum of Renaissance sculpture has also received noteworthy additions within the last few years. One of the very rare bronze busts of the Florentine school of the fifteenth century has been added to another, donated some time ago by the King of Prussia; and, oddly enough, it is plain that they both represent the same individual. A colored terra-cotta bust, which tradition and internal evidence alike pronounce the work of the painter Francia, and which represents a singularly beautiful young man, was secured in 1876, at the recommendation of the Crown Princess, who perceived its value as it stood neglected on a chimney-piece in the Palazzo Pepoli in Bologna; its recently-deceased owner having used it as his wig-block! An uncolored (or no longer colored) terra-cotta bust from Venice is anonymous, but most interesting in its simple realism which differs greatly from the subtilely artistic realism of the Tuscan school. A fine marble bust of Florentine workmanship is also anonymous, but shows much analogy with the work of Rossellino. But the greatest treasures of recent date came from the Palazzo Strozzi along with the paintings already noted. They include a colored terra-cotta bust of Filippo Strozzi, evidently the model for Benedetto da Majano's marble now in the Louvre; a marble bust of Niccolo Strozzi by Mino da Fiesole; and—more beautiful than aught else—Desiderio da Settignano's famous marble of Marietta Strozzi. No work of the time has been more highly praised than this, from the pages of Vasari down to those of Mr. Perkins who rediscovered fifteenth-century sculpture, and of his very latest followers. And none better deserves all that the most delicately sympathetic pen could write. In all the great gallery of Renaissance portraiture it has no superior in execution and no equal, save the lovely *Femme Inconnue* of the Louvre, in

rare and elusive charm. It incarnates the most attractive side of Italian sculpture as it was in the second half of the fifteenth century; that sculpture which is called realistic as compared with the art of the Periclean age, but which is in truth ideal too, though in a very different way. The feminine theme of Phidian art was woman in the broadest, deepest, noblest meaning of the word; the abstract, archetypal, elementary woman raised to a divinely ideal height. The feminine theme of the later fifteenth-century Florentine sculptors on the other hand was the actual woman of their own day, the refined complex sophisticated woman actually produced by centuries of human life and culture; the modern *lady* if I may be allowed the word. This theme many artists ideally expressed in their saints, madonnas, and allegoric figures; and, still more distinctly, yet still ideally, it seems to me in portraiture. We never say of these Renaissance women that they are grand, superb, imposing and divine — not always even that they are academically beautiful; but we always say that they are incomparably charming, exquisite and refined, inimitably—yes, ideally, high-born, well-bred, aristocratic, *gentle*. Look at this Marietta Strozzi with her slightly tilted head so haughtily, yet so graciously poised, with her firmly-carried shoulders, her half-closed lids and her vanishing smile, and you will see what, for want of a better word, I must call again the very ideal of ladyhood. And a similar sort of charm lies in the workmanship too, which seems so very simple and direct, yet is in reality one of the most sophisticated, carefully calculated, subtilely finished results that have ever been seen in art of any kind. Are there no more Strozzis, one wonders, or have they souls of stone and eyes of clay that they should turn into money this exquisite piece of their own flesh, which a great artist had turned for them into exquisite and imperishable art? Certainly there is no need to-day for the lover of art to join the communists; for are not the nobles of England stripping their homes as fast as they can; perhaps I should write as fast as they dare? Are not the conservative burghers of Germany, and the aristocrats of Italy alike ready to part with the most intimate memorials of their former greatness? And are not all their treasures falling with a steady stream into the public's lap? It is curious to see how rapidly the days of the traditional connoisseur, dillettante and private collector are passing away. The most authoritative critics now write for the general public; the amateur usually "realizes" on his treasures in his own lifetime; and whether he does or not, his hoard goes not to another cabinet, but to an open temple where the lowliest may worship, and the most ignorant may learn. Art is getting again to be, as of old, a thing for the people; but in a different way, with the *museum* standing instead of the church, the town-hall, and the semi-public palace.

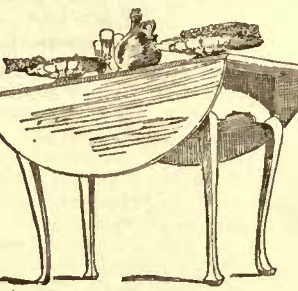
I may add that besides the busts I have named (which with earlier acquisitions make the Museum of Berlin the richest in Renaissance portraiture save only that of Florence), the statuette of David with the honey-comb, all but universally believed to be by Michael Angelo, has lately been purchased; and also a well-known feminine bust from Scala; one of the two works which are illustrated in every hand-book as the only known relics of Italian portraiture of the thirteenth century.

Many minor Berlin collections must go without even a mention. I have space but to speak of the Museum of Industrial Art which was founded in 1867 as part of the general Industrial Museum but soon achieved independent existence and has lately been lodged in an immense new building of its own. Large purchases were made at the Vienna Exposition, and from private collectors. For the treasures of Baron Minutoli thirty-seven thousand five hundred dollars were paid in 1869, and a few years ago one hundred and sixty-five thousand dollars were given for the plate of the city of Lüneburg; thirty-six large pieces of Gothic and Renaissance silversmith's work. In 1875 no less than nine thousand objects were transferred to the *Kunstgewerbe Museum* from the Royal *Kunstkammer*, and gifts, bequests and purchases are daily increasing the list. The collection already ranks as one of the very finest on the Continent, and it seems to me the richest in Germany in works of the Renaissance period, though inferior to Munich and Nuremberg in Gothic examples. As an instructive contrast to the way in which the Metropolitan Museum, for instance, is managed, I will note that here the utmost freedom and encouragement are given to students, and that the catalogue — or rather guide — is really instructive. (It would be almost impossible fully to catalogue such a collection and to keep the work always up to date; but additional information is afforded by an intelligent labelling of all the principal objects). No one need ask permission to draw from any exhibited object save such as are loaned or are of modern make. To reproduce these the consent of the owner is essential. An excellent library of books, periodicals and photographs is connected with the Museum and is also most liberally administered. In this despotic land the public collections are, in fact as well as in name, for the use and the good of the public; but there are certain cities in a free country of which I do not think the same can be said.

M. G. van Rensselaer.

A Large Brazilian Dam. — An enormous dam, says the *American Engineer*, is to be built in Brazil, under the direction of French engineers. The main portion will be 940 feet long by 58 feet high, and two smaller ones will close side depressions. It is calculated that this work will back the water over some 1,500 acres, and retain 14,000,000 cubic metres of water, sufficient, it is claimed, to provide for all the cattle of the region during a period of three years, and for the irrigation of five thousand acres of flat bottom-land alongside the river-bed below.

THE A B C PROCESS AT AYLESBURY, ENGLAND.



Breakfast-Table and Silver Cake Basket from Old Furniture Collection of the late Mr. E. G. Shaw N. Beverly. Mass.

THE directors of the Native Guano Company have just published the report of the experiments recently made on the A B C process by Dr. Tidy and Professor Dewar, the results of which, as recorded in diagrams and tabulated statements, certainly go far to establish the fact of its producing a satisfactory effluent. The experiments were conducted very carefully, precautions having been taken to guard against a possibility of particularly favorable or unfavorable conditions influencing the results, by collecting samples of the raw sewage and effluent every half-hour, and mixing equal portions of four consecutive half-hour samples for chemical examination. By this means three series of experiments were obtained, differing in the quantity as well as in the strength of the raw sewage to be dealt with. The mode in which the process is carried out appears to be that the B C mixture is first run evenly into the sewage, and completely and immediately deodorizes it, no escape of offensive odors into the surrounding air taking place. The alum solution is added afterwards, as it was found that the addition of the precipitating ingredients separately afforded better results.

In the first series of experiments, attention was more especially directed to the matters in suspension and solution, both in sewage and effluent, and the relation between the organic and inorganic portions respectively, the quantity of organic matter being determined by the amount of oxygen required to oxidize it, and which was found to average 1.795 grains per gallon in the sewage, and 0.522 grains in the effluent, showing that 74.8 per cent of the organic matter had been removed. Of the suspended matter, 89.3 per cent had been intercepted, while the ratio of inorganic to organic matter was in the sewage as 1 to 1.18, and in the effluent as 1 to 6, which showed that the suspended matter left in the latter was principally organic. The matters in solution yielded a mean of 46.3 grains per gallon in the raw sewage, and 57.5 grains in the effluent.

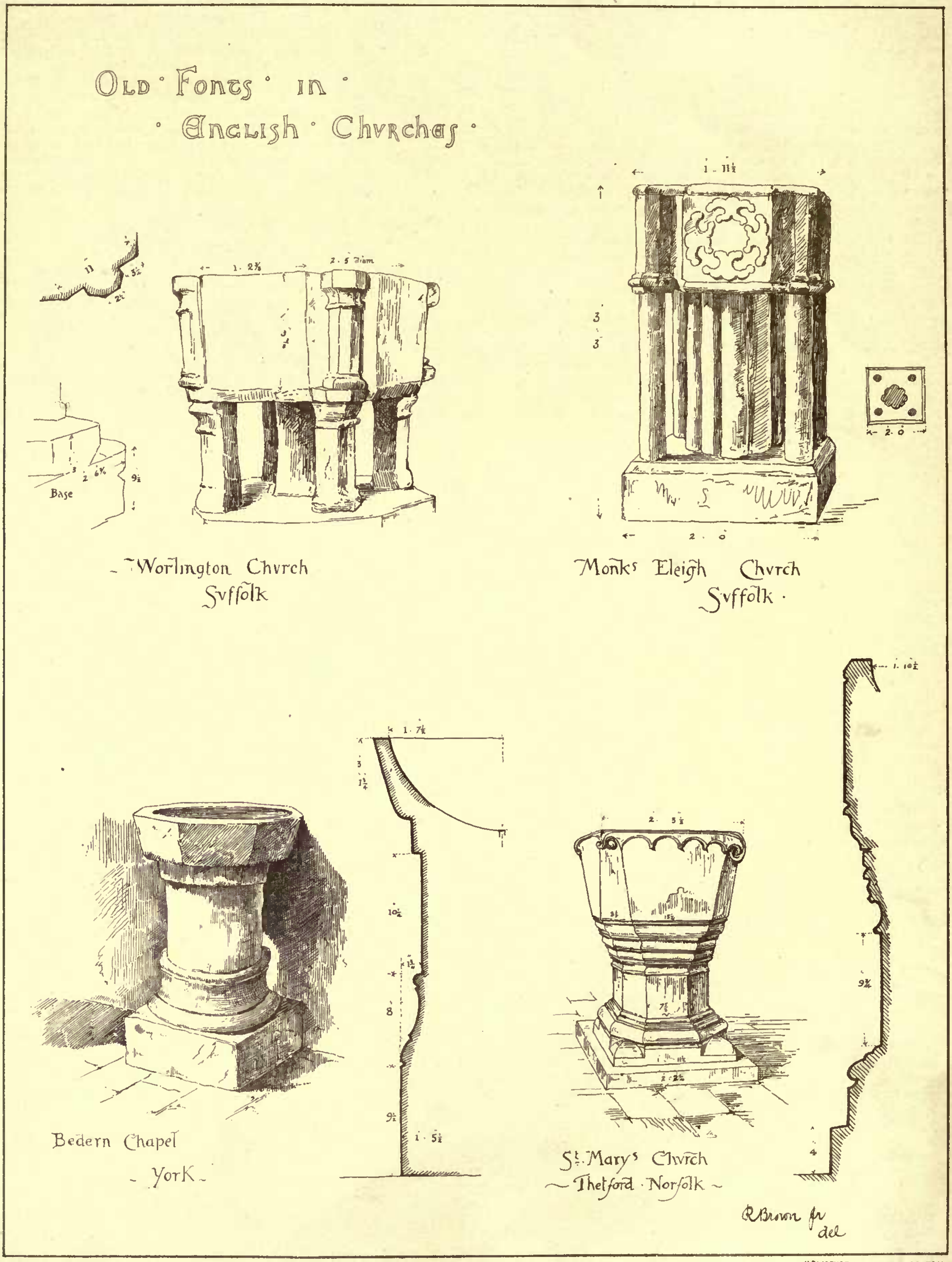
The second series of experiments was devoted to a consideration of the character of the organic matter, both in the sewage and effluent, before and after filtration. The results obtained showed that 83.3 per cent of the oxidizable organic matter had been removed by the treatment in the unfiltered state, and 61.4 per cent from the filtered sewage; also that one-seventh of the organic matter in the sewage, and one-sixth of that in the effluent, was volatile. The suspended matter removed in this series reached as high as 96.8 per cent, while a great improvement in the deposition of the sludge over that observed in the first series was apparent, although the quantity of precipitating material used was only slightly more than one-third of the total weight of sludge produced. This series of experiments was characterized by a very large flow, a greatly increased strength of sewage, and the improved working of the process.

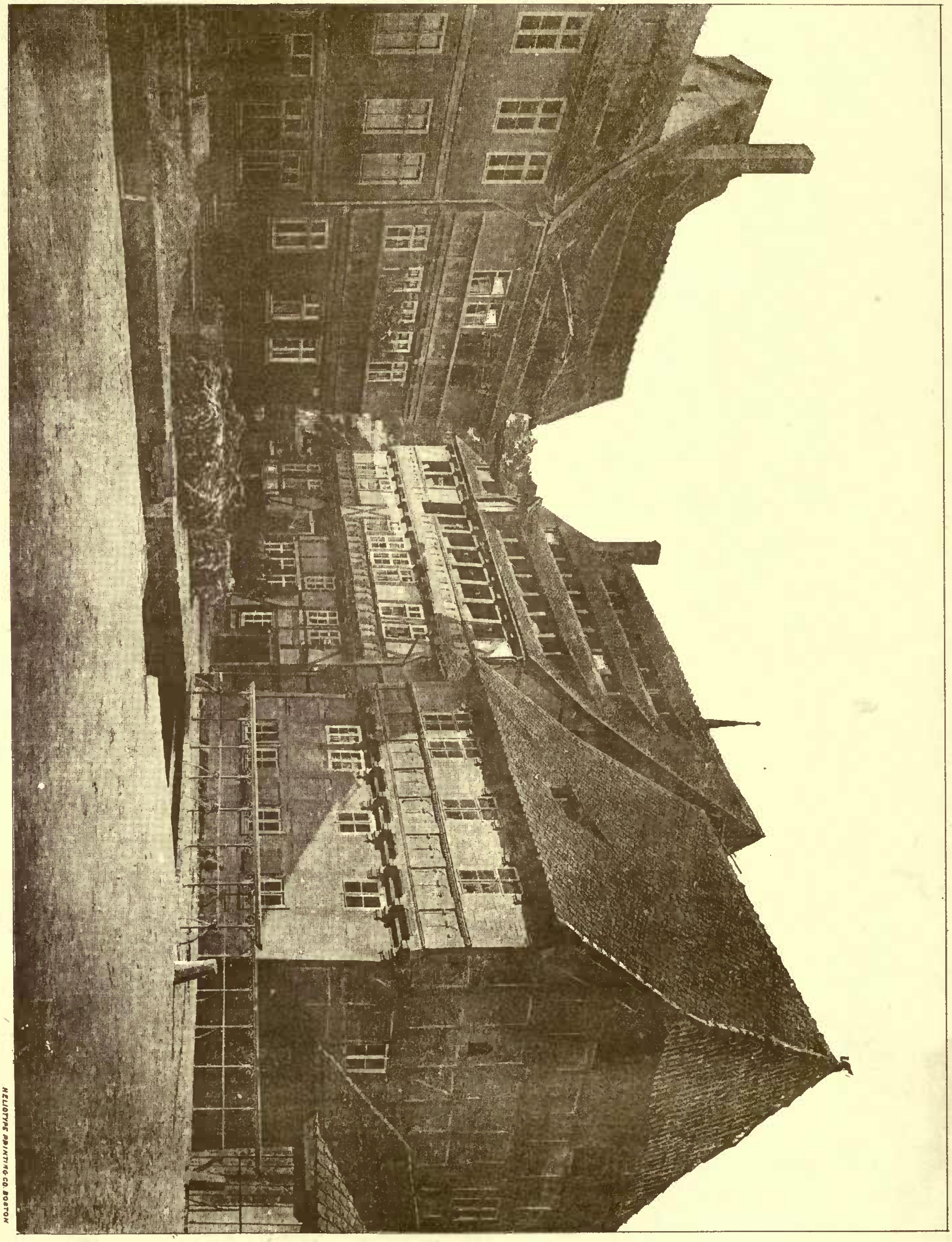
The third series was taken principally on account of the very dry weather which had been prevailing, and the consequent unusual strength of the sewage. The results showed a removal of 86.3 per cent of oxidizable organic matter, while the removal of the suspended matters, notwithstanding they reached the abnormally large amount of 246.3 grains per gallon, was so complete that the effluent was devoid of turbidity, and contained only 0.98 of a grain. The conclusion arrived at is that the A B C process is capable of producing a uniform effluent under very varying conditions and degrees of concentration of the sewage.

After concluding the experiments with the first part of the process, viz., the purification of sewage, the second process — that of the drying of the sludge and its conversion into a salable manure under the name of Native Guano — was subjected to examination.

The manure is, in fact, only the partially-dried precipitated sludge mixed with some sulphate of magnesia and ground. One curious feature of the process is, it is explained, the large amount of heat developed in the interior of the heaps of the cylinder-dried manure, both before and after grinding, which continues for many months in the stacked manure without any apparent diminution, reaching a maximum temperature of 113° Fahrenheit, at which it remains, without emitting steam or any apparent sign of heating on the surface of the heap until it is turned over. Instead of any loss of ammonia resulting from this action, an examination of the gases showed that they contained only .01 per cent of ammonia, and 5 per cent of carbonic acid, suggestive of the action being due to oxidation, and not to any fermentative process. But direct experiments for determining the actual loss of ammonia in the preparation and subsequent heating brought out the fact that a manure was obtained containing only twenty per cent of moisture without its manurial value being sensibly affected, so far as the loss of available ammonia was concerned.

It must be admitted that the experiments carried out by Messrs. Tidy and Dewar prove that the A B C process is unquestionably very effective, as far as the purification of sewage and the production of a sufficiently pure effluent are concerned. Of course the

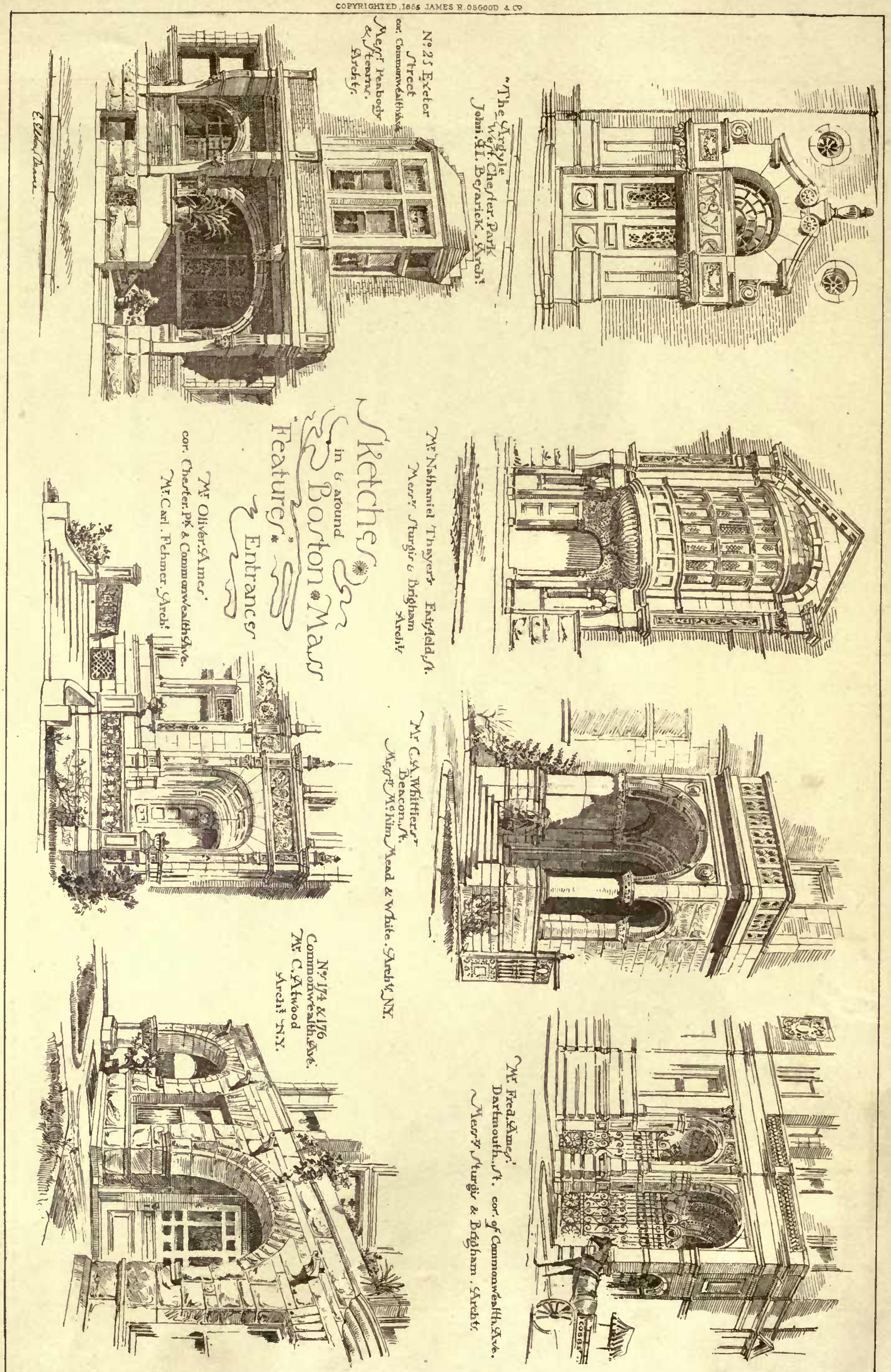

Old · Fonts · in ·
· English · Churches ·
Worlington Church
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OLD HOUSES, HALBERSTADT, GERMANY. - 1884.

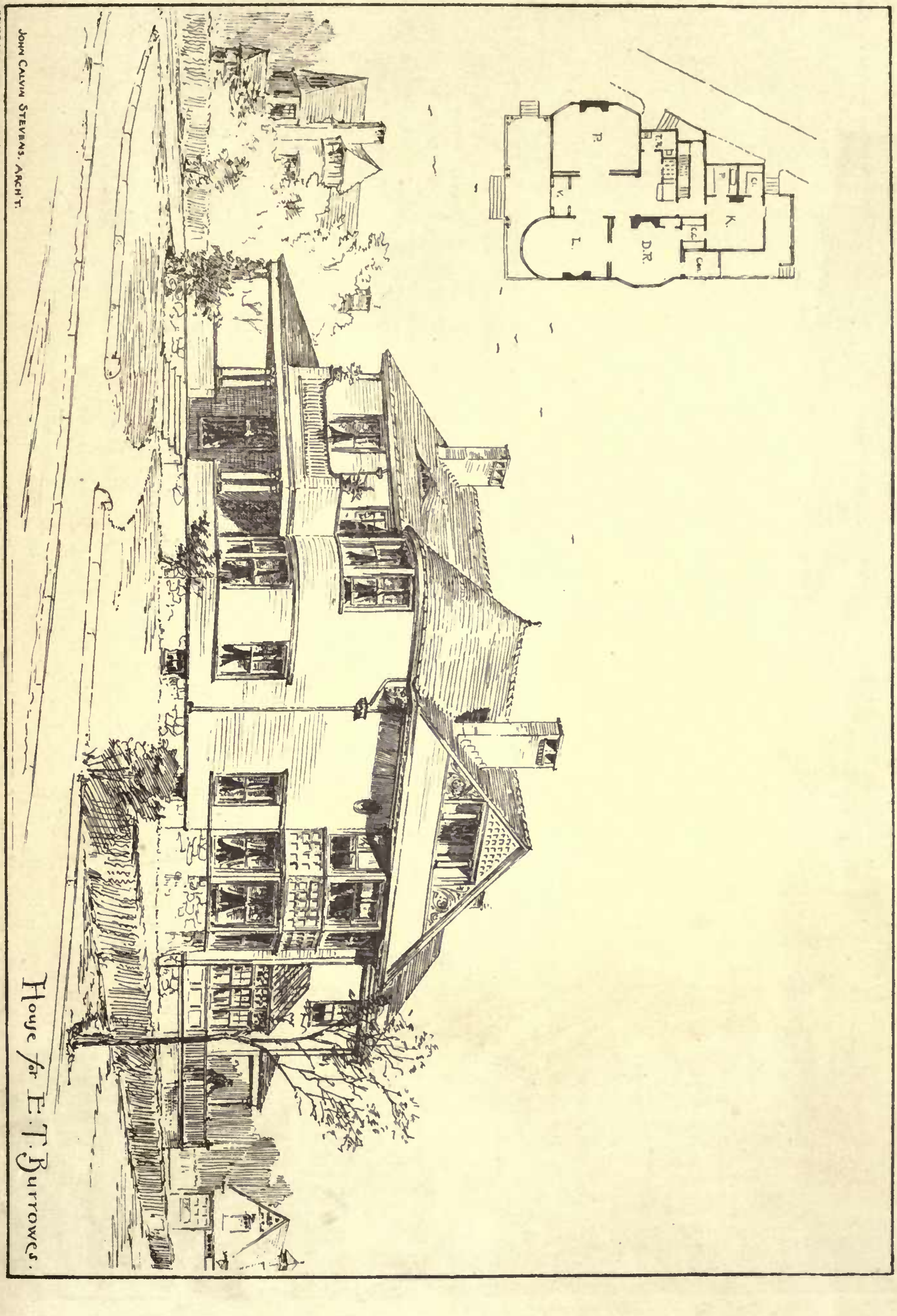
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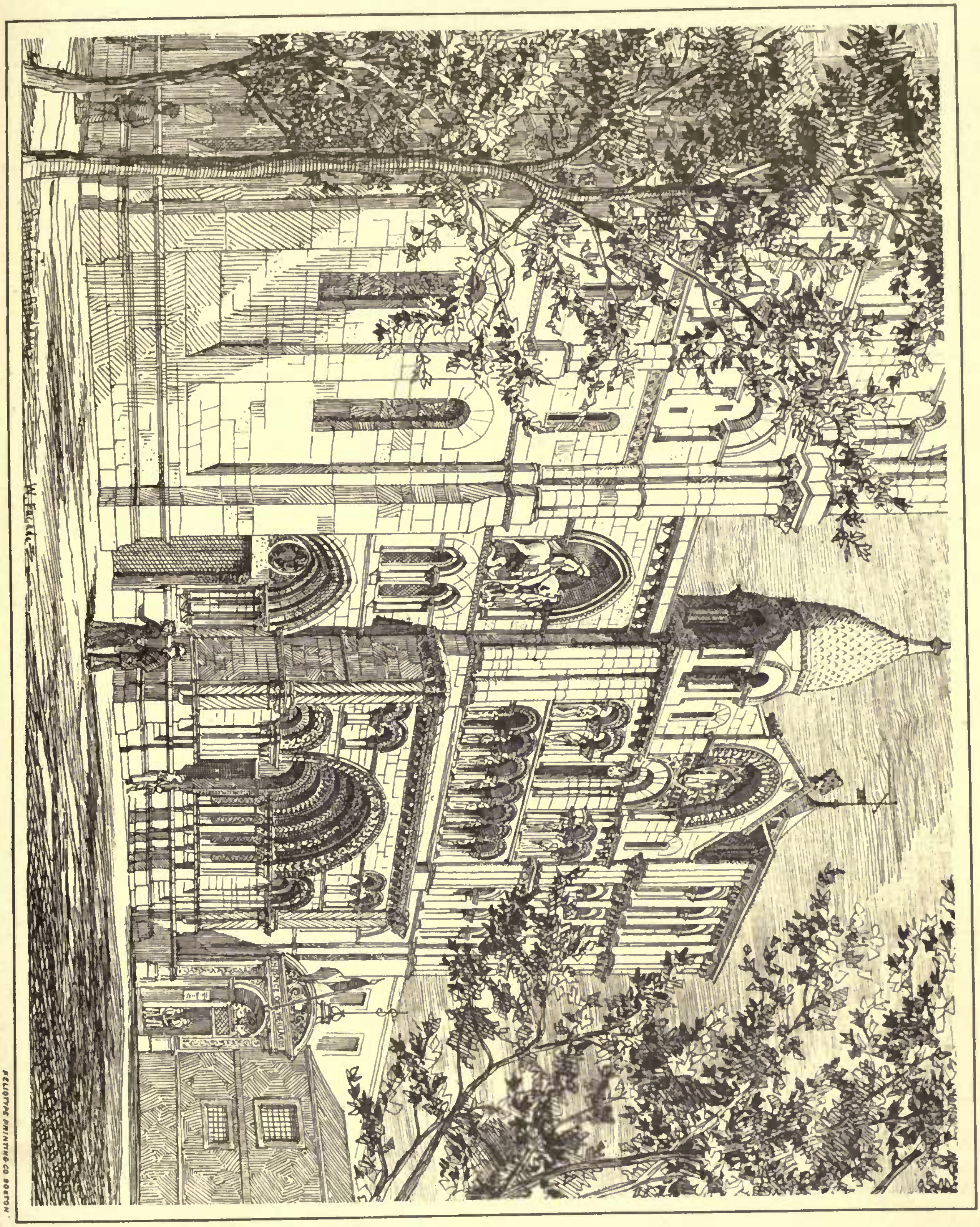
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American Architect and Building News, July 11 1885 No. 498





THE BELFRY, BRUGES BELGIUM,- 1884.



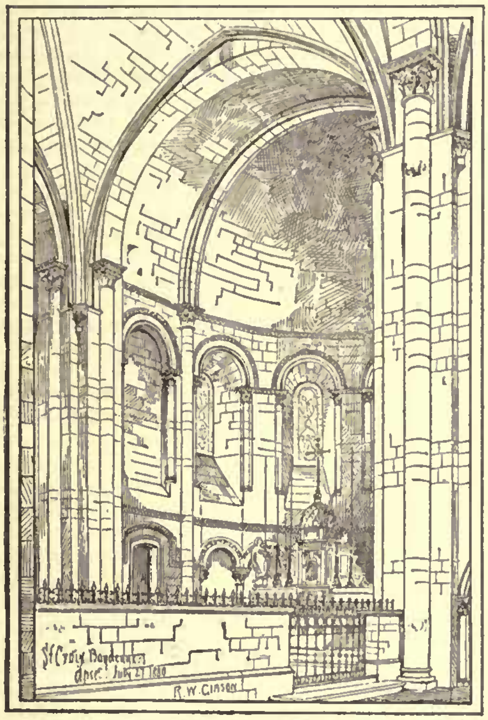
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commercial aspect of the question is not one into which they were called upon to enter. How far the expense of the process will admit of its adoption in other localities, or whether any or what proportion of the outlay is recoverable from the sale of the manure, are points which must be determined or explained by the commercial results to the company itself. It has been repeatedly asserted by eminent authorities and experts that sludge, however treated, is not worth its carriage for agricultural purposes, except under very exceptional circumstances. Sewage, however, cannot await the determination of its commercial value, but must be got rid of from all great centres of habitation as quickly and effectively as possible, and economically if practicable. Whether the last condition is an accompaniment of the A B C process yet remains to be demonstrated.— *The Builder.*

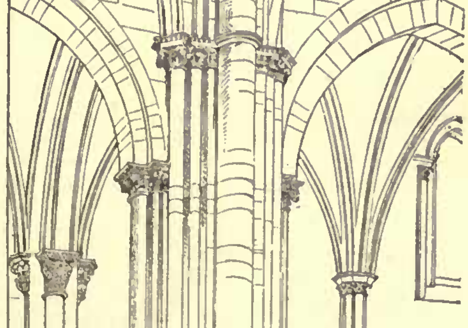
THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

ST. CROIX, BORDEAUX, FRANCE.[1]



THE church of St. Croix, Bordeaux, is a highly interesting building of various epochs, dating from the tenth century, but including considerable work of the eleventh and twelfth and lastly (this being of a different nature) of the nineteenth. The successive additions and alterations are easily traceable. Externally, for example, the piece of façade between the north tower and the old Romanesque nave-end is clearly Gothic of a later period than anything around it. The more ancient doorways are very fine examples of the early architects' success with this, their favorite feature. It was no ordinary ability which designed arches in these highly-elaborated orders, which retain their simplicity and force with such exuberant decoration. The bases and stylobates are very effective, too, though somewhat complicated. They were probably not quite accurately reproduced in the modern restorations, which were, however, apparently very thorough and careful works. The façade above has the characteristic contrasts of carving and massive plainness, and, although so cut up into detail, has a certain breadth which is necessary. The upper parts of each section, however, show weakness: the roof was always the troublesome feature in this style, and is rarely successful.



Internally, less is left of the old edifice. The apse is exceedingly good; the proportions and details are excellent. But there is another valuable hint to the modern architect, who hesitates for so many reasons to imitate Romanesque round arches in circular walls. The effect here is that of a circular wall, but the arches are all straight on plan, the very obtuse angles in the masonry being only such slight departures from a curve that the half-dome above is not at all injured in effect. Rather, on the contrary, the walls get an accession of strength in their rectilinear arrangement. It is the solution of a problem which many students have despaired of. Perhaps externally the device will not be so good, because sunlight will define too sharply the different planes, but for internal effect with practicable details, this Bordeaux apse is a better model than any I know of in the style.

The vaults of the nave are later than the original. It appears that there had been a plain barrel or tunnel vault with transverse arches which were retained; diagonal ribs supported upon flat clusters of shafts being added on each side of the massive column. The result is not particularly happy, but it is interesting, and is a good example of how such buildings declare their own history.

R. W. GIBSON.

[1] See also an illustration published in the *American Architect* for December 6, 1884.

HOUSE OF E. T. BURROWES, ESQ., PORTLAND, ME. MR. J. CALVIN STEVENS, ARCHITECT, PORTLAND, ME.

THIS house is to be built of wood, with broad, overhanging gables. Finished in a substantial manner, using hard-woods in lower story. It will cost about $7,500.

THE BELFRY, BRUGES, BELGIUM.

THIS well-known belfry forms the striking feature of the market-place in which it stands. It was built in the last part of the fourteenth century although it bears on its front the date 1619 — the date of some probable restoration. The tower is 350 feet high, and is somewhat out of the vertical to the south-east.

SCENE IN HALBERSTADT, GERMANY.

DWELLING-HOUSE DOORWAYS ABOUT BOSTON.

THE DECAY OF STONE ON THE GROUND LEVEL.



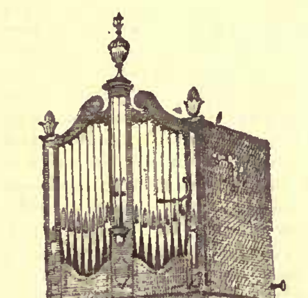
THE decay of stone on the ground level of buildings is a subject of great importance and anxiety to those responsible for substantial erections in this material; for in many instances, before the work can be got out of hand by the contractors, signs of disintegration present themselves, and before many years have passed the evil has intensified to such an extent that the lower parts of the building are in a state of decay bordering upon ruin. The same evil presents itself in connection with old buildings, and it is invariably the case that this dissolution in the lower part of the building hastens the process of disintegration over the whole fabric.

This detail of decay in stone is traceable in a primary sense to absorption of water from the foundations, but in a secondary sense to a variety of causes. Absence of a damp-course, as in old buildings, is a prime cause of this decay of stone on the ground line, and inefficient damp-course is a secondary cause. These are intensified by thick walls, filled-in with rubble and grout, backed by a damp or humid atmosphere. In some cases it is accelerated by the finished ground being inadvertently brought above the damp-course, or by stone paving being brought up to its level, wherein the beating rain gets access to the superstructure. The character of the stone used in the building of a house is an important factor. A porous sandstone, like the millstone grit of the Carboniferous system, is extremely durable; whilst a porous limestone, like the Bath and Ancaster stones of the Oolitic system, is extremely perishable. The reason of this is not far to seek, for the cementing medium in the sandstone is silica, impervious to the action of water travelling to the face of the stone to evaporate in the rarefied atmosphere; while the cementing medium in the limestone is carbonate of lime, more or less in a state of crystallization, but nevertheless more or less solvent in water, containing as it does, in important centres, a dangerous amount of carbonic acid. In the former case the stone will give out its water without ruin being stamped upon its face, whereas in the latter the mineral matter, unable to pass into the air, will crystallize on the outer face or skin, an operation that will mark the decay of the stone by disintegration.

In a humid climate like England, stone, independently of its connection with the foundation of a building, will, during half the year, be conducting the process of absorption. This is an operation so well known that stone walls have an unenviable character for their dampness, a character that invariably causes them to be built hollow, or lined with brick or a framework of wood. The same stone, during the summer season, will be giving off its stored-up moisture, an operation of no moment on the north side of a building, where the absorbing power of the sun is not experienced, but one that on the south side will be carried to a great and a dangerous extent. It is to the absence of the sun on the north side of a building, and the uniform character of the moisture in the stone, that it is always in a better state of preservation than the south side, and it is to the presence of the sun on the south side, and the extremes of moisture, heat and dryness experienced by the stone, that it is invariably found in a decayed or ruinous state. The moisture present in the north

and south walls of a building in the winter or humid season is identical, the reverse being the case in the summer, for the north wall, if the surroundings are favorable, will be coated with moss or lichen, whilst the south wall will be dry and arid. It is to this high or active state of evaporation in the sun that the decay of stone on the ground line is, if not actually brought about, certainly accelerated. So much is this the case, that if we examine the north wall of a building we shall find the line of disintegration on the ground level scarcely marked, while the line on the south or other sides exposed to the influence of the sun, illustrates an advanced state of decay. It naturally follows that special attention should be brought to bear on all but the north sides of a building; the damp-course should here be most effectual, and the walling upon it placed above any possible contact with the ground, or the influence of beating rains. The ashlar work should be constructed in a stone whose power of absorption is of a low order, for it is to the large measure of absorption and evaporation, in the absence and presence of the sun, that dissolution is brought about. In carrying out this policy, care should be exercised in avoiding all projections, recesses, etc., which collect and distribute water, on what is known as the drip principle, a principle most markedly at variance with the preservation of stone. If these features are imperative, arrangements should be made for collecting and removing the water, a thing by no means impossible where wall pipes are introduced in connection with the roofs. If a porous stone is used, more especially if it be limestone or dolomite, we advise the coating of the same with preservative composition, a material, on the one hand, that prevents undue absorption, and, on the other, undue evaporation. In giving this advice we are not unmindful of the fact that it gives to the stone a paint-like surface for a time; but it has proved so efficient in the extensive restorations carried out on the south side of York Cathedral, by the late and lamented G. E. Street, that we have no hesitation in advocating it.— *W. S., in the Building News.*

CRAZY QUILT ARCHITECTURE.



THE following from the pen of Bill Nye, in the Chattanooga *Times*, contains more truth than fiction, and is well worth reading: —

It may be premature, perhaps, but I desire to suggest to any one who may be contemplating the erection of a summer residence for me, as a slight testimonial of his high regard for my sterling worth and symmetrical escutcheon — a testimonial more suggestive of earnest admiration and warm personal friendship than of great intrinsic value, etc.—that I hope he will not construct it on the modern plan of mental hallucination and morbid delirium tremens peculiar to recent architecture.

Of course a man ought not to look a gift house in the gable end, but if my friends don't know me any better than to build me a summer-house, and throw in odd windows that nobody else wanted, and then daub it up with colors they have bought at auction, and applied to the house after dark with a shotgun, I think it is time that we had a better understanding.

Such a structure does not come within either of the three classes of Renaissance. It is neither Florentine, Roman nor Venetian. Any man can originate such a style of architecture if he will drink the right kind of whiskey long enough, and then describe his feelings to an amanuensis. Imagine the sensation that one of these modern, sawed-off cottages would create a hundred years from now, if it should survive. But that is impossible. The only cheering feature of the whole matter is that these creatures of a disordered imagination must soon pass away, and the bright sunlight of hard horse sense shine in through the shattered dormers and gables of gnawed-off architecture of the average summer resort. A friend of mine, a few days ago, showed me his new house with much pride. He asked me what I thought of it. I told him I liked it first rate. Then I went home and wept all night. It was my first falsehood.

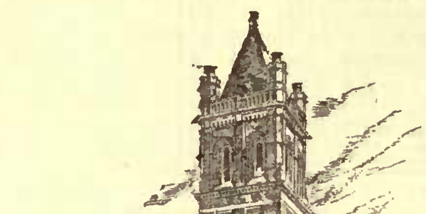
The house taken as a whole looked to me like a skating-rink that had started out to make money, and then suddenly changed its mind, and resolved to become a tannery. Then ten feet higher it had lost all self respect and blossomed into a full-blown "drunk and disorderly," surmounted by the smoke-stack of a foundry, and with the bright future of thirty days ahead with the chain-gang. That's the way it looked to me.

The roofs were made of little odds and ends of misfit rafters and distorted shingles that somebody had purchased at sheriff's sale, and the rooms and stairs were giddy in the extreme. I went in and rambled around among the cross-eyed staircases and other nightmares till reason tottered on her throne. Then I came out and stood on the architectural wart called the side porch, to get fresh air. This porch was painted a dull red, and it had wooden rosettes at the corners that looked like a bran new carbuncle on the nose of a social wreck. Farther up on the demoralized lumber pile I saw now and then places where the workman's mind had wandered, and he had nailed on his clapboards wrong side up, and then painted them with the Paris green that he had intended to use on something else. It was an odd-looking structure, indeed. If my friend got all the material for nothing from people who had fragments of paint and lumber left over after they failed, and then if the workmen constructed it nights for mental relaxation, and intellectual repose, without charge, of course the scheme was a financial success, but architecturally the house is a gross violation of the statutes in such cases made and provided, and against the peace and dignity of the State.

There is a look of extreme poverty about the structure which a man might struggle for years to acquire and then fail. No one could look upon it without feeling a heartache for the man who built that house, and probably struggled on year after year, building a little of it at a time as he could steal the lumber, getting a new workman each year, building a knob here and a protuberance there, putting in a three-cornered window at one point, and a yellow tile, or a wad of broken glass and other débris at another, patiently filling-in around the ranch with any old rubbish that other people had got through with, and painting it as he went along, taking what was left in the bottom of the pot after his neighbors had painted their bob-sleds or their tree boxes — little favors thankfully received — and then surmounting the whole pile with a pot-pourri of roof, a grand farewell incumbus of bumps, and hollows for the rain to wander through and seek out the different cells where the lunatics live who inhabit it.

I did tell my friend of one thing that I thought would improve the looks of his house. He asked me eagerly what it could be. I said it would take a man of great courage to do it for him. He said he didn't care for that. He would do it himself. If it only needed one thing, he would never rest until he had it, whatever that might be. Then I told him that if he had a friend — one that he could trust — who would steal in there some night while the family were away, and scratch a match on the leg of his breeches, or on the breeches of any other gentleman who happened to be present, and hold it where it would ignite the alleged house, and then remain there to see that the fire department did not meddle with it, he would confer a great favor on one who would cheerfully retaliate in kind at call.

WHAT CAUSES PAINT TO BLISTER AND PEEL? HOW TO PREVENT IT.



THIS subject has been treated by many, but out of the numerous ideas that have been brought to bear upon it, the writers have failed to elucidate the question fully, probably owing to the fact that in most parts they were themselves dubious as to the real cause. Last year W. S. gave a lengthy description in the *Building News* [1] in which he classified blistering and peeling of paint into one of blistering only. He stated in the beginning of his treatise the following:

"The subject of blistering of paint has from time to time engrossed the attention of practical men; but so far as we can follow it in the literature pertaining to the building trade, its cause has never been clearly laid down, and hence it is a detail enshrouded in mystery."

W. S. dwells mostly, in his following explanations on blistering paints, on steam raised in damp wood. Also an English painter, according to the *Painters' Journal*, lately reiterates the same theory, and shows sundry ways in which water will get into wood through paint, but is oblivious that the channels which lead water into wood are open to let it out again. He lays great stress on boiled oil holding water in suspense to cause blistering, which is merely a conjecture. Water boils at 212° F., and linseed oil at 600° F., consequently no water can possibly remain after boiling, and a drop of water put into boiling oil would cause an explosion too dangerous to be encountered.

It will be shown herein that boiled oil, though in general use, is unfit for durable painting, that it is the cause of most of the troubles painters have to contend with, and that raw linseed oil seasoned by age is the only source to bind pigments for durable painting; but how to procure it is another trouble to overcome, as all our American

[1] See the *American Architect* for June 2, 1883.

raw linseed oil has been heated by the manufacturers, to qualify it for quick drying and an early market, thereby impairing its quality. After linseed oil has been boiled it becomes a poor varnish; it remains soft and pliable when used in paint, giving way to air pressure from the wood in hot weather, forming blisters. Turpentine causes no blistering; it evaporates upon being exposed, and leaves the paint in a porous condition for the gas in the wood to escape; but all painters agree that blistering is caused by gas, and on investigation we find two main sources from which gas is generated to blister paint — one from the wood, the other from the ingredients of the paint. The first named source of gas is started in hot weather by expansion of air confined in painted wood, which presses against the paint and raises blisters when the paint is too soft to resist. Tough, well-cemented paint resists the pressure and keeps the air back. These blisters mostly subside as soon as the air cools and returns to the pores, but they subsequently peel off.

W. S. and others assert that damp in painted wood turns into steam when exposed to sun heat, forming blisters, which cannot be possible when we know that water does not take a gaseous form (steam) at less than 212° F. They have very likely been deluded by the known way of distilling water with the aid of sunshine without concentrating the rays of the sun, based upon the solubility of water in air, viz.: Air holds more water in solution (or suspension) in a warmer than in a cooler degree of temperature; by means of a simple apparatus sun-heated air is guided over sun-heated water, when the air saturated with water is conducted into a cooler, to give up its water again. But water has an influence toward hastening to blister paint; it holds the unhardened wood-sap in solution, forming a slight solvent of the oil, thereby loosening the paint from the wood, favoring blistering and peeling. There is a certain kind of blister which appears in certain spots or places only, and nowhere else, puzzling many painters. The explanation of this is the same as before — soft paint at these spots, caused by accident or sluggish workmen having saturated the wood with coal oil, wax, tar, grease, or any other paint-softening material before the wood was painted, which reacts on the paint to give way to air pressure, forming blisters.

The second cause of paint blistering from the ingredients of the paint happens between any layer of paint or varnish on wood, iron, stone, or any other substance. Its origin is the gaseous formation of volatile oils during the heated season, of which the lighter coal oils play the most conspicuous part; these, being less valuable than all other volatile oils, are used in low-priced japan driers and varnishes. These volatile oils take a gaseous form at different temperatures, lie partly dormant until the thermometer hovers at 90° F. in the shade, when they develop into gas, forming blisters in air-tight paint, or escape unnoticed in porous paint. This is the reason why coal-tar paint is so liable to blister in hot weather; an elastic, soft coal-tar covering holds part of its volatile oil confined until heated to generate into gas; a few drops only of such oil is sufficient to spoil the best painted work, and worse, when it has been applied in priming, it settles into the pores of the wood, needing often from two to three repetitions of scraping and repainting before the evil is overcome. Now, inasmuch as soft-drying paint is unfit to answer the purpose, it is equally as bad when paint too hard or brittle has been used, that does not expand and contract in harmony with the painted article, causing the paint to crack and peel off, which is always the case when either oil or varnish has been too sparingly and turpentine too freely used. Intense cold favors the action, when all paints become very brittle, a fact much to be seen on low-priced vehicles in winter time. Damp in wood will also hasten it, as stated in blistering, the wood-sap undermining the paint.

To avoid peeling and blistering, the paint should be mixed with raw linseed oil in such proportions that it neither becomes too brittle nor too soft when dry. Priming paint with nearly all oil and hardly any pigment is the foundation of many evils in painting; it leaves too much free oil in the paint, forming a soft undercoat. For durable painting, paint should be mixed with as much of a base pigment as can possibly be spread with a brush, giving a thin coat and forming a chemical combination called soap. To avoid an excess of oil, the following coats need turpentine to insure the same proportion of oil and pigment. As proof of this, prime a piece of wood and a piece of iron with the same paint; when the wood takes up part of the oil from the paint and leaves the rest in proportion to harden well, where at the same time the paint on iron remains soft. To be more lucid, it need be explained, linseed oil boiled has lost its oleic acid and glycerine ether, which form with the bases of pigments the insoluble soap, as well as its albumen, which in boiling is thrown out. It coagulates at 160° F. heat; each is needed to better withstand the action of wind and weather, preventing the dust from attaching itself to a painted surface, a channel for ammonia in damp weather to dissolve and wash off the paint. In later years linseed oil has been extracted from linseed meal by the aid of naphtha and percolation, the product of a very clear, quick-drying oil, but lacking in its binding quality, no doubt caused by the naphtha dissolving the fatty matter only, leaving the glycerine and albumen in the meal.

All pigments of paint group according to their affinity to raw linseed oil into three classes. First, those that form chemical combinations, called soap. This kind is the most durable, is used for priming purposes, and consists of lead, zinc, and iron bases, of which red lead takes up the most oil; next, white lead, the pure carbonate Dutch process made, following with zinc white and iron carbonates, as iron-ore paint, Turkey umber, yellow ochre; also faintly the chromates of lead — chrome-green and chrome-yellow, finishing with the poorest of all, modern white lead, made by the wet or vinegar process. The second class, being neutrals, have no chemical affinity to linseed oil; they need a large quantity of drier to harden the paint, and include all blacks, vermilion, Prussian, Paris, and Chinese blues, also terra de Sienna, Vandyke brown, Paris green, verdigris, ultramarine, genuine carmine, and madder lake. The last seven are, on account of their transparency, better adapted for varnish mixtures — glazing. The third class of pigments act destructively to linseed oil; they having an acid base (mostly tin salt, hydrochloride of tin, and redwood dye) form with the gelatinous matter of the oil a jelly that will neither work well under the brush nor harden sufficiently, and can be used in varnish for glazing only; they are not permanent in color, and among the most troublesome are the lower grades of so-called carmines, madder lakes, rose pinks, etc., which contain more or less acidous dyes, forming a soft paint with linseed oil that once dry on a job can be twisted or peeled off like the skin of a ripe peach. All these combinations of paint have to be closely observed by the painter to insure his success.

Twenty-five years ago a house needed to be painted outside but once in from five to seven years; it looked well all the time, as no dust settled in the paint to make it unsightly. Painters then used the Dutch-process-made white lead, a base, and raw linseed oil, a fat acid, which formed the insoluble soap. They also put turpentine in the following coats, to keep up the proportions of oil and pigment. All held out well against wind and weather. Now they use the wet-process-made white lead, neutralized by vinegar, with oil neutralized by boiling, from the first to the last coat, and — fail in making their work permanent.

W. S., in the *Building News*, relates an unaccountably mysterious blistering in a leaky house, where the rain-water came from above on a painted wood wall, blistering the paint in streaks and filled at the lower ends with water, which no doubt was caused by the water soaking the wood at the upper ends where there was no paint, and following it down through the fibres, pushed and peeled off the soft, inadhesive paint. Green, sappy and resinous wood is unfit for durable painting, and to avoid blistering and peeling wood should be well seasoned and primed with all raw linseed oil, some drier, to insure a moderately slow drying, and as much of a base pigment as the painter can possibly spread (much drier takes up too much oil acid, needed for the pigment base to combine with), which insures a tough paint that never fails to stand against blistering or peeling, as well as wind, weather, and ammonia.

The coach, car and house painter can materially improve his painting where his needs lie by first oiling the wood with raw oil, then smoothing the surface down with lump pumice-stone, washing it with a mixture of japan drier or, better yet, gold sizing and turpentine, wiping dry, and following it up with a coat of white lead, oil and turpentine. The explanation is: the raw oil penetrates the wood and raises the wood fibres on the surface to be rubbed down with pumice-stone, insuring the best surface for the following painting; to harden the oil in the wood it receives a coat of japan drier, which follows into the pores and there forms a tough, resinous matter, resisting any air pressure that might arise from within, and at the same time acts on the first coat of lead as a drier. This mode insures the smoothest and toughest foundation for the following painting, and may be exposed to the hottest July sun without fear of either blistering or peeling. — *Louis Matern, in the Scientific American.*

THE ROTCH TRAVELLING SCHOLARSHIP.

BRICK CHURCH (Essex County), N. J., June 26, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Can you inform me about the "Rotch Travelling Scholarship," or where I can get information of the same? Whether there will be a competition this year? What is required of the competitors to gain admission? And what is the subject for competition, etc.; and kindly oblige "INQUISITIVE."

[ADDRESS Mr. Arthur Rotch, 85 Devonshire St., Boston. — EDS. AMERICAN ARCHITECT.]

THE BEST TEN BUILDINGS.

NEW YORK, June 26, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Having read the results of your canvass, to discover the ten architecturally best buildings in America, and being very much interested in the result, will you kindly allow me to ask you whether it is impossible, or not, for you to print sketches or drawings of them, say on one sheet, for better comparison. Some of them have already appeared in the *American Architect*, I know, but would not the value of the result you have obtained be very greatly enhanced by an opportunity given your readers to judge of them side by side? Hoping that you may see your way clear to this, I remain,

Very truly yours, ONE INTERESTED.

[PUBLICATION in the form suggested would be very unsatisfactory, as drawings at the small scale prescribed by the size of our page would prove to be mere outline sketches. Sooner or later all the buildings mentioned will be published in our pages. A prime reason for calling out the vote was to furnish ourselves with a list of buildings which would form desirable subjects for illustration.—EDS. AMERICAN ARCHITECT.]

Exeter, N. H., June 29, 1885.

To the Editors of the American Architect: —

Dear Sirs,—Can you kindly inform me if illustrations of the above buildings have appeared in the *American Architect?* If so, in what issue? (The dates of same?) If not, will they appear in future issues? I am a subscriber to your journal, and possess a complete file, from Vol. I, No. 1. Very truly yours,

Charles Marseilles.

[Gelatine prints of Trinity Church, Boston, appeared in the *American Architect* for February 3, 1877; of the United States Capitol, December 21, 1878; of the State Capitol at Hartford, Conn., January 31, 1885; of the Town-Hall, North Easton, Mass., May 19, 1883. Views of the Albany Capitol (proposed alterations) appeared March 11, 1876: and of the Jefferson Market Court-House, June 15, 1878.—Eds. American Architect.]

Baltimore, Md., June 27, 1885.

To the Editors of the American Architect: —

Dear Sirs, — If not too much trouble would like answers to the following questions: 1. What three languages do you consider the most important to an architect? 2. To whom would it be necessary to apply at Harvard College for information, concerning qualifications, etc., to enter? Yours respectfully, F. K. T.

[1. English, French, German. 2. Address Mr. C. J. White, Registrar of Harvard College, Cambridge, Mass.—Eds. American Architect.]

A DRIVING PLATFORM.

Huntingdon, Pa., July 3, 1885.

To the Editors of the American Architect: —

Dear Sir,—I have a sort of a platform or deck to make some 60′ x 14′, which is to be a driving platform, exposed to the weather above, and to act as a roof to what is below. I propose to put down a floor on heavy joists and girders of, say, one-inch flooring oak, then on top of that some water-proof substance, and on top of all four-inch strips of two-inch oak. Now what would you advise to put between the upper and lower course? If tin, it will rust. How would two or three ply tarred roofing-felt, then a coat of hot pitch and nail the two-inch strips down into that.

Probably you can suggest some other plan, or can supply an article especially desirable for the centre coating.

Very truly, J. C. Blair.

[The flooring manufactured by W. L. Dolbeare, 522 Atlantic Ave., Boston, has given excellent satisfaction in stables, where the horses are kept on the upper floors. The New England Felt Roofing Co., 22 Milk St., Boston, make somewhat of a specialty of making floors on much the same plan as indicated by our correspondent, and we believe that the New York Mastic Works, 29 Waverley Pl., New York, produce a satisfactory floor by using some of their bituminous preparations.—Eds. American Architect.]

NOTES AND CLIPPINGS.

Earthquakes. — M. Perey, a Dijon astronomer, offers a novel explanation of the frequency of the earthquakes which have produced so much disturbance on the surface of our planet of late. His theory is that they are caused, like the tides, by the attraction of the sun and moon, and he argues that it is only natural to suppose that the sea of fire in the interior of the globe obeys the same influences as the ocean on its surface. M. Perey has investigated the particulars of no fewer than 5400 different shocks of earthquake, and a comparison of their dates demonstrates that these phenomena are most frequent during the periods of full and new moon. He has further ascertained that the shocks have been most violent when the moon has been in the meridian of the place where they occurred, just as the tide in a seaport over whose meridian the moon is passing is higher than that in any of the neighboring ports. — *Boston Herald.*

Forest Preservation. — At the opening of the morning session of the second day of the Convention of the American Society of Civil Engineers, Mr. F. Collingwood, of Elizabeth, N. J., read a paper on the preservation of forests. The paper presented a large number of statistics collected from various sources, its purpose being to show the necessity of exercising economy in the use of forest products and the apparent possibility of a wood famine. The writer concluded that the supply of white pine in the United States is certain to be exhausted before the end of this century, and probably in Canada also. Of Southern pines, at the present rate of consumption there is stated to be one hundred and fifty years' supply of spruce and hemlock. East of the Mississippi there is probably twenty-five years' supply of hard wood. The supply of black walnut and ash is being rapidly exhausted. The supplies of other kinds of wood are, however, so abundant that a famine cannot be predicted. In reference to tree planting, the writer states that intelligently undertaken in regions where timber is scarce, a fair return is made on the investment. In the discussion that followed it was insisted by Messrs. Collingwood, Eggleston and others, that timber planting can be made as profitable as crop planting. —*New York Commercial Advertiser.*

Violation of a Pope's Tomb. — The *Stampa*, a prominent Italian Liberal journal, tells the following strange story: On the night between the 19th and 20th of May the old church of Sta. Maria de Gradi, in the city of Viterbo, was entered by the Secretary to the Municipality, the City Engineer, and a band of workmen. They proceeded to the tomb of Pope Clement IV, whose body had lain in a marble sarcophagus in the church since his death in 1268. The sarcophagus was opened, and an inner coffin of wood was found. Upon opening this they found the remains in a fair state of preservation, and clad in the vestments suitable to the Papal rank. They did not touch anything, but closed both coffin and sarcophagus. Next morning they returned, accompanied by the Sindico of the city and the Sub-Prefect of the district. The corpse was then taken out of the coffin; the ring, in which there was a precious stone, was taken from the finger; the richly embroidered silk gloves and sandals were torn off. The agraffe which fastened the cope on the breast, and which was richly mounted with precious stones, was cut out; and those portions of the cope which were of gorgeous workmanship and in good preservation were cut away. The remains were then huddled into a box and sent off to the municipal buildings; the articles that had been removed were, according to the Sindico, to be placed in the museum of Viterbo. The *Stampa* observes that if a poor man's grave were thus violated, the law would give some months' imprisonment to the criminals. Will not the same measure be given to the disturbers of a Pope's tomb, which is one of Italy's historic monuments? And it calls on all the newspapers of the peninsula to publish the outrage, and bring public opinion to demand the punishment of the principals, whoever they may be.

A Gigantic Kitchen. — Mr. O. V. Morgan, who recently paid a visit to Norway, speaks in terms of praise of the great public kitchen, which is one of the lions of Christiana. Established in 1857, this kitchen had for several years but a chequered existence; however, for years past it has been a highly successful institution. The capital employed in building, etc., approaches £10,000. Attached to the kitchen and eating-rooms is a shop, where meat, bread, dairy produce, etc., are on sale at very moderate prices. Upwards of 3,000 meals are served daily. The dinners consist of soup or some farinaceous dish (porridge being a favorite), meat, vegetables, and one sweet, all of good quality, and nicely served. The cost of such a meal is 47 ore, equal to 6*d.* By reducing the number of plates, a corresponding saving is effected. A somewhat reduced price is made to those who take the food away, instead of eating in the spacious halls. The establishment is directed by a Board, consisting of three members, selected by the shareholders, and act without salary. The Board engages the general manager, who has charge of all the purchases, and superintends the daily business. There are also engaged a cashier, a book-keeper, a head cook with three assistants, a machinist, two ticket-clerks, three ladies in the shop, four waiters, four under-waiters, an out-door servant, and twenty-nine women, occupied with the distribution of the dinner in plates, its delivery, and other work. The cooking is performed in double cast-iron boilers of 000 quarts size; according to the circumstances, direct or indirect steam is used. There are seven boilers. The roasting is done on a kitchen-range, heated in the usual way. The steam necessary to the kitchen, the laundry, the heating of the dining-hall, and the working of the engine for the manufactory of forced meat, is supplied by a steam-engine of 25-horse power. The annual consumption of the following articles amounts to:— Meat, about 650,000 lbs.; bacon, 40,000 lbs.; butter, 20,000 lbs.; dried cod, 30,000 lbs.; peas, 45,000 lbs.; rice, 11,000 lbs.; barley groats, 33,000 lbs.; raw sugar, 22,000 lbs.; refined sugar, 20,000 lbs.; prunes, 9,500 lbs.; juices for flavoring, 33,000 quarts; potatoes, 900,000 lbs.; different kinds of greens, 80,000 lbs.; bread, 130,000 lbs.; milk, 110,000 quarts; beer, 10,000 quarts; and spices, 2,200 lbs. — *Sanitary World.*

Boston's One-Rail Elevated Road. — They now have a charter which allows them to form a company and build one mile of their road in the city of Cambridge. When that is done, if the Railroad Commissioners approve the new road as practical and safe, the company will be allowed to build into and upon Boston streets, provided the City Government gives permission. The work they have just begun is the building of a 2500-foot section of their peculiar new railroad, also an engine and a car such as they propose to use. The new railroad is somewhat difficult to describe without a technical knowledge of engineering and the use of technical terms. Its chief characteristic is a single rail elevated upon a line of posts, at a height of fourteen feet from the ground. It is called a single, though perhaps a more correct description would be two rails placed one above the other at a distance of four feet, and connected by a series of braces. The supports or posts are placed at distances of forty-five feet, and are almost exactly like those of the New York elevated railroad, except that the lower end is firmly encased in concrete and rests upon a solid bed of concrete several feet underground. The truck frame of the cars is placed astride the rail, like a saddle upon the back of a horse, and each truck frame has six wheels. Upon either side two of these wheels run upon the lower part of the rail, inclining upward and outward from the point of contact at an angle of forty-five degrees. The other two wheels are placed horizontally under the car and level with the top of the rail, along the sides of which they run, one upon either side. By means of hydraulic pressure, applied from the engine, they are made to clasp the rail tightly, and by this power of traction the forward or backward motion is secured. Each wheel has an independent axis of its own, and, by a most ingenious contrivance under the car, the opposing wheels are always kept at right-angles with the rails, regardless of curves. Some of the curves may be very sharp; steep grades may be overcome by means of the traction power. The truck frames of the locomotive are like those of the car, with the connecting rods attached to the horizontal wheels upon either side of the rail. The pressure of the wheels upon the rails is such as to make it almost impossible for them to leave it, but in case this should happen the car could not leave the track. It would simply drop an inch and a half and slide along, resting upon the top of the rail, the truck frame serving as a substantial brace upon both sides. The cars are of novel pattern, cylindrical in form, and built of iron. In carrying out their plans for this unique railroad, the builders have, of course, to guard against horizontal strain upon the rail, which surface roads have nothing to do with, but they are confident that the precautions they have taken will make accidents almost impossible. People are very quick to laugh at the idea of putting an engine and cars fourteen feet from the ground upon a single rail, but the scheme is certainly bearing the rigid inspection of engineers and other scientific men wonderfully well, and nobody has yet risen to prove that the principles on which it is based are not sound. — *Letter to the Minneapolis Tribune.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

320,472. LATCH AND LOCK COMBINED. — William Hill, Mount Vernon, Ill.
320,474. FIRE-ESCAPE.—Marshall B. Ingersoll, Regina, Manitoba, Can.
320,480. REGISTERING FAUCET. — Louis C. Lane, Cincinnati, O.
320,485. LEVER-LATCH. — John J. Maas, Albany, N. Y.
320,506. PLUMB-LEVEL. — Charles Schofield, Minneapolis, Minn.
320,508. ROOFING. — Charles H. Starr, Logansport, Ind.
320,518. WOOD ORNAMENTATION. — Gardner A. Watkins, Gardner, Mass.
320,521. LOCK.—Charles E. Whittlesey, New Haven, Conn.
320,527. DOOR-CHECK. — Wilhelm Bahre, Berlin, Germany.
320,537. SPIRIT-LEVEL.—Bozwell B. Butt, Newark, N. J.
320,551. SASH-LOCK. — Horace E. Gilmore, Spring Hill, Kans.
320,555. CHALK-LINE REEL. — Henry F. Haslam, New Britain, Conn.
320,567. TILE-SETTING.—Andrew H. Lord, Chicago, Ill.
320,589. APPARATUS FOR HOLDING SHINGLES FOR PAINTING.—William W. Robinson, Ripon, Wis.
320,602. KNOB ATTACHMENT.—Garret Van Winkle, North Plainfield, N. J.
320,608. CHIMNEY TOP AND VENTILATOR. — William P. Wilson, Trenton, N. J.
320,616. APPARATUS FOR UNITING WOOD FOR FLOOR COVERINGS. — Henry Beisheim, Rochester, N. Y.
320,625. CISTERN FOR WATER-CLOSETS. — Peter Carney, New York, N. Y.
320,648. PORTABLE HEATING APPARATUS.—Chas. D. P. Gibson, Jersey City, N. J.
320,660. BURGLAR-ALARM.—Alexander Jacobi, St. Clair, Mich.
320,661. GAS-TIGHT EXPANSION-JOINT. — Deming Jarves, Detroit, Mich.
320,664. FIRE-ESCAPE.—Ogden G. Lee, Poughkeepsie, N. Y.
320,667. DRAIN AND DRAIN-TILE.—Francis M. Marquis, Zanesfield, O.
320,674. TRESTLE. — George W. Murray, Mount Crawford, Va.
320,675. SASH-LOCK. — Thomas R. Nichols, Lynn, Mass.
320,685. ELECTRIC BELL. — Henry B. Porter, Chicago, Ill.
320,686. BURGLAR-ALARM.—Morris Pratt, Milton Junction, Wis.
320,696. APPARATUS FOR UNITING WOOD FOR FLOOR COVERINGS, ETC. — Charles F. Rider, Rochester, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty-two permits have been granted, the more important of which are the following: —

R. Armiger & Son, four-st'y brick factory, 33' x 70', w s Greenmount Ave., bet. Preston and Hoffman Sts., and four-st'y stone building, 50' x 73', in rear.

A. W. Heath, three-st'y brick building, n s Preston St., bet. Valley and Holland Sts.

Seth A. Marchant, 26 two-st'y brick buildings, e s Chester St., bet. Jefferson and McElderry Sts., and 4 two-st'y brick buildings, s s McElderry St., bet. Chester St. and Duncan Alley.

Peter Bremer, 12 two-st'y brick buildings, w s Payson St., com. s w cor. McHenry St; 7 two-st'y brick buildings, s s McHenry St., w of Payson St.; and 7 two-st'y brick buildings, n s Wilhelm St., w of Payson St.

J. S. Mogarity, 4 three-st'y brick buildings, s s Preston St., e of Bond St.

Jos. H. Riemar, 2 three-st'y brick buildings, e s Camel Alley, e of Linden Ave.

Jas. B. McKee, three-st'y brick building, w s Eutaw St., s of Hill Ave.

M. E. Iceman, 2 two-st'y brick buildings, w s Pennsylvania Ave., s of Baker St.

John O. Richter, 11 two-st'y brick buildings, w s Fulton Ave., bet. Lorman St. and Fulton Terrace.

John Schonewolf, etc., 4 two-st'y brick buildings, w s William St., s of Gittings St.

Thos. Hitaffer, 6 three-st'y brick buildings, w s Fulton Ave., com. s w cor. Lorman St.

Jewish Hospital, three-st'y brick addition to hospital, n w cor. Monument and Ann Sts.

A. Strauss & Bro., three-st'y brick building, n w cor. Canton Ave. and Duncan Alley.

Boston.

BUILDING PERMITS. — *Wood.* — *Station St.*, on Line Boston & Providence R. R., storage, 25' x 40'; owner, Boston & Providence R. R.; builder, G. F. Folsom.

Savin St., near Warren St., dwell., 23' x 39'; owner, Leonard Wilson; builders, Wilson Bros.

Gibson St., near Adams St., mechanical building, 16' x 22'; owner, F. L. Nichols; builder, J. R. Atwood.

Leeds St., near Savin Hill Ave., dwell., 16' x 39'; owner, Mrs. S. M. McNeil; builder, John Bass.

Elm St., near Ford St., stable, 20' x 20'; owner, John Booth; builder, G. W. Adams.

Bennington St., near Moore St., stable, 11' x 14', owner and builder, C. E. Randall.

North Beacon St., near Everett St., shed, 30' x 40'; owner and builder, G. W. Wild.

Howard Ave., near Dudley St., dwell., 20' x 40'; owner, W. Elliott; builder, C. A. Jefferson.

Dudley St., near Centre St., storage, 18' x 24'; owner and builder, John Hill.

Codman St., near Hutchinson St., storage, 20' x 70'; owner, City of Boston; builder, Paving Department.

Sullivan St., near Florence St., mechanical-building, 20' x 20' and 30'; owner and builder, J. Richardson.

M St., No. 172, dwell., 23' x 38'; stable, 33' x 46' 6"; owner, Fred Louis; builder, D. A. Berry.

Dennis St., near Moreland St., dwell., 17' x 45'; owner and builder, B. F. Bean.

Brooklyn.

BUILDING PERMITS. — *Monroe St.*, s s, 25' e Marcy Ave., 5 three-st'y Connecticut brown-stone dwells., tin roof; cost, $29,000; owner, John Hooper, 63 Centre St., New York; architects, Wm. Field & Son.; builder, Paul C. Grening.

Broadway, w s, abt. 25' s Sumner Ave., two-st'y frame dwell., tin roof; cost, $1,250; owner, Elizabeth Furman, Broadway, cor. Sumner Ave.; architect and builder, C. A. Le Quesne.

Java St., n s, 25' e West St., 3 three-st'y frame (brick-filled) tenements, gravel roofs; cost, $13,400; owner, Mrs. Mary A. Bliss, 207 Washington Park; architect, F. Weber; builders, Post & Walker.

Broadway, No. 303, n s, bet. Ninth and Tenth Sts., four-st'y brick store and tenement, tin roof; cost, $8,000; owner, Wm. F. Garrison, 96 Bedford Ave.; architect and mason, Jas. Rodwell; contractors, C. L. Johnson's Sons.

Atlantic Ave., n s, 75' w Nostrand Ave., two-st'y brick stable, tin roof; cost, $4,000; owner, John J. Drake, 397 Fulton St.; architect, J. H. Van Winkle.

Third St., n w cor. North Eighth St., four-st'y brick store and tenement, tin roof, iron cornice; cost, $11,000; owner, Fr. Mesloh, 320 Third St.; architect, A. Herbert; builder, V. Bruchhauser.

Chauncey St., Nos. 203-203½, n s, 275' e Patchen Ave., 2 two-st'y and basement dwells., tin roofs; cost, each, $2,500; owner, John Bryan, 31 Willoughby St.; builder, J. Dhuy.

Carlton Ave., w s, 257' 4" n Atlantic Ave., four-st'y brick dwell., tin roof; cost, abt. $12,000; owner, Jas. L. Dougherty, 493 Fulton St.; architect, C. E. Hebberd.

Quincy St., n s, 100' w Patchen Ave., 5 two-st'y brick dwells., tin roofs; cost, each, $4,500; H. Batterman, Reid Ave., cor. Quincy St.; architect and builder, Thos. Miller.

Huron St., No. 131, being 455' e Franklin St., four-st'y frame tenement, gravel roof; cost, $5,800; owner, H. J. Babin, 223 Hewes St.; architect, A. Van Dien; builders, Post & Walker.

Elm St., No. 145, n s, 250' 4" w Central Ave., three-st'y frame dwell., tin roof; cost, $4,000; owner, Robert B. Miller, 128 Jefferson St.; architect, Thos. Engelhardt; builder, T. D. Eadie and Casper Wahler & Son.

Nineteenth St., s s, 225' w Ninth Ave., one-st'y brick building, tin roof; cost, $6,000; owner, Wm. M. Brasher, Eighth Ave., cor. Eighteenth St.; architect, — Griffin; builder, Wm. Corrigan.

Humboldt St., e s, from Moore to Varet St., 8 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, each, $3,300; owner and builder, Charles Engert, 182 Montrose Ave.; architect, F. J. Berlenbach, Jr.

St. James Pl., n w cor. Atlantic Ave., four-st'y brick tenement, tin roof; cost, $7,000; owner, Wm. Moses, 281 St. James Pl.; architect, A. Hill; builder, J. Stafford.

Greenpoint Ave., n s, 100' w Manhattan Ave., 5 four-st'y brick stores and tenements, tin or gravel roofs; cost, each, $6,000; owners, architects and builders, Randall & Miller, 493 Fourth St., of 4 houses, and Thomas McHugh, owner of 1 building; mason, Van Riper.

Fort Green Pl., e w cor. Lafayette Ave., four-st'y brick dwell., gravel roof; cost, $8,000; owner, Thos. Clark, 685 Fulton St.; architect, J. Mumford; builders, T. B. Rutan and W. S. Wright.

Third Ave., n e cor. Carroll St., three-st'y brick store and dwell., tin roof; cost, $6,000; owner, Michael Maher, 494 Carroll St.; architect, F. Ryan; builder, J. R. Anderson.

Van Brunt St., e s, 25' Dikeman St., four-st'y brick store and tenement, tin roof, wooden cornice; cost, $7,995; owner, J. N. Brandenburg, 365 Van Brunt St.; architect, P. H. Gilvarry; builders, J. Kolle and C. M. Detlefsen.

ALTERATIONS. — *Fulton St., Nos.* 95 *and* 97, add 3' to height; also, three-st'y brick extension, tin roof; wrought-iron beams, etc.; cost, $5,800; owner, Helene Kiesel, 85 Fulton St.; builder, J. G. Porter.

Sixth St., s s, 175' w Second Ave., two-st'y frame extension, gravel roof; cost, $1,000; owners, Arndis & Gecour, foot Sixth St. Gowanus Canal; architect, C. Arndis; builder, O. Christmann.

Marshall St., on water front, bet. Hudson Ave. and Gold St., one-st'y brick extension, gravel roof; cost, $6,225; owners, Atlantic White Lead Co.; architect and contractor, W. N. Rae; mason, P. Castner.

Chicago.

BUILDING PERMITS. — C. Heeper, 2 two-st'y dwells., 14 Warren Ave.; cost, $3,500.

J. Freund, two-st'y addition, 14 Warren Ave.; cost, $3,500.

Mrs. M. Smeeth, two-st'y dwell., 38 Astor St.; cost, $5,000; architects, Frohman & Jebsen.

Mrs. D. Evers, three-st'y store and flats, 298 Sedgwick St.; cost, $4,000.

A. Pearson, stores and dwells., Oakley St.; cost, $8,000.

J. A. McLennen, five-st'y stores and flats, Thirty-first St.; cost, $100,000; architect, J. A. McLennen.

E. Weise, three-st'y store and flats, 849 Clybourne Ave.; cost, $4,500.

F. & M. Kelly, two-st'y flats, 249 Loomis St.; cost, $4,000.

H. Wiuhordt & Co., two-st'y storehouse, 402 to 404 North Wood St.; cost, $4,000.

B. S. Theodorson, three-st'y flats, 19 Milton Ave.; cost, $4,000; architect, B. S. Theodorson.

J. Mergen, three-st'y store and flats, 1158 Milwaukee Ave.; cost, $8,000; architect, H. Cley.

Cummins & Howard, addition to hotel; Wabash Ave. and Adams St.; cost, $75,000; architects, Treat & Foltz.

H. Sibley, 2 two-st'y warehouses, 2 to 18 North Clark St.; cost, $10,000.

E. Snowhook & Co., three-st'y store and flats, 165 Chicago Ave.; cost, $4,000.

V. P. Smith, two-st'y dwell., 3238 to 3246 Cottage Grove Ave.; cost, $9,000.

W. L. Potter, two-st'y dwell., 478 Belden Ave.; cost, $10,000.

E. Hudson, two-st'y dwell., 3201 to 3203 Wabash Ave.; cost, $13,000,

A. E. Jamme, three-st'y store and dwell., 204 to 208 Milwaukee Ave.; cost, $6,000.

Mrs. L. Coleman, three-st'y dwell., Prairie Ave.; cost, $35,000; architects, Cobb & Frost.

H. Redick, two-st'y flats, 63 Siegel St.; cost, $2,500.

H. Poepeke, one-st'y engine-house; cost, $5,000,

W. Mohlmann, two-st'y flats, 246 West Division St.; cost, $4,000.

Chicago Gas Light & Coke Co., two-st'y purifying house, 190–208 Hawthorne Ave.; cost, $20,000; builder, R. E. Mass.

G. W. Burchard, 3 two-st'y dwells., 3362–3366 Calumet Ave.; cost, $13,500; architect, J. Austin.

H. Kielman, three-st'y flats, 159 Larrabee St.; cost, $6,000; architect, J. Bruhuf.

E. P. Roberts, three-st'y flats, 119 Lincoln St.; cost, $4,000; architect, W. H. Drake.

L. H. Eames, two-st'y dwell., 531 State St.; cost, $12,000; architect, L. G. Halberg.

C. L. Jenks, one-st'y addition, cor. Taylor and Clark Sts.; cost, $1,500; architect, Spyer.

S. G. DeLeasy, two-st'y dwell., 2212 Dearborn St.; cost, $5,300.

J. Morris, 5 two-st'y dwells., Groveland Park Ave.; cost, $15,000; architects, Wheelock & Clay.

H. M. Dickey, two st'y dwell., Groveland Park Ave.; cost, $3,500.

P. Nelson, 2 two-st'y stores and dwells., 293–295 West Erie St.; cost, $7,000.

E. L. Bonney, two-st'y dwell., 1103 Genesee St.; cost, $3,300.

J. H. Gault, two-st'y dwell., 493 Congress St.; cost, $5,000; architect, L. B. Dixon.

J. C. Thor, two-st'y dwell., 178–180 West Ohio St.; cost, $4,000.

F. W. Wolf, two-st'y office, 560 North Halsted St.; cost, $5,000; architect, F. W. Wolf.

Cincinnati.

BUILDING PERMITS. — Y. A. Sefel, 3 two-st'y brick buildings, Addison and Spring Grove; cost, $6,000.

A. Schindler, three-st'y brick building, Poplar St. and Western Ave.; cost, $5,000.

Rebecca Deikman, three-st'y brick building, Wade and Greene Sts.; cost, $4,900.

McMara & Conner, three-st'y frame building, Halstead and Eliza Sts.; cost, $7,000.

Aug. Kennel, three-st'y brick building, cost, $5,000.

M. S. Glenn, two-and-one-half-st'y brick building, 460 West Third St.; cost, $3,500.

Total, $31,400.

Repairs, $6,610.

Total to date, $1,322,720.

Total permits to date, 599.

Kansas City, Mo.

BUILDING PERMITS. — Dr. S. F. Campbell, double brick house on Grove St.; cost, $5,000.

W. T. Johnson, brick business block in Perry Pl.; cost, $10,000.

R. G. Estelle, 7 brick business stores and dwells. on Fifteenth St., near Charlotte St.; cost, $23,000.

A. G. Redenbaugh, 4 frame houses, cor. Seventeenth St. and Tracy Ave.; cost, $6,000.

George Sheidley, brick and cut-stone business block, four-st'y, at 808 Walnut St.; cost, $15,500.

Thomas E. Gillespie, double brick house, three-st'y, on Central St.; cost, 10,000.

Minneapolis, Minn.

BUILDING PERMITS. — H. Rushford, two-st'y brick veneer dwell., Buchanan St. cor. Twenty-fourth St., n e; cost, $3,000.

Swan Peterson, two-st'y brick store-building and flat, Twentieth St., bet. Fifteenth and Sixteenth Aves., s; cost, $3,500.

C. E. Gates, boiler-and-engine house, Grant St., bet. Willow St. and Spruce Pl.; cost, $3,600.

Cargill & Hagley, elevator-building, cor. Twenty-ninth St. and Eleventh Ave., s; cost, $25,000.

Miner Ball, five-st'y brick block, n e cor. Third St. and Ninth Ave., s; cost, $30,000.

George H. Shepherd, two-st'y frame dwell., e cor. First Ave. and East St.; cost, $10,000.

Martin Keller, two-st'y frame dwell. and barn, Western Ave., bet. Fourteenth and Sixteenth Aves., n; cost, $5,800.

New York.

There is hardly any estimating now being done, but there continues to be great activity amongst the speculators.

FACTORY. — A five-st'y brick factory, 50' x 100', and a tenement, 27' x 80', will be built on the s e cor. of Avenue A. and Eightieth St., for Mr. G. P. Lies, from plans of Messrs. Schwarzmann & Buchman.

HOUSES. — Mr. Terence Kiesman will build 4 four-st'y first-class houses, 18' 9" front, on the n s of Eighty-fourth St., 100' w of Eighth Ave., to cost about $70,000.

On the s w corner of Sixth Ave. and One Hundred and Sixteenth St., 12 four-st'y and basement dwells., 20' front, are to be built for Mr. Jacob D. Butler, at

a cost of about $240,000, from plans of Messrs. Hubert Pirsson & Co.

On the s s of Seventy-second St., 450′ e of Eleventh Ave., two houses, 20′ x 88′, are to be built for Mr. Thos. G. Denniston, at a cost of about $60,000, from plans of Mr. C. H. Gilbert.

On the s s of One Hundred and Twenty-first St., bet. Sixth and Seventh Aves., Mr. F. Crawford will build 8 three and four story houses, 20′ x 60′, from plans of Mr. G. A. Schellenger, to cost about $140,000.

Building Permits.—*Bowery, No.* 233, one-st'y brick dwell. and store, tin roof, cost, $3,000 to $4,000; owner's agents, E. A. Cruikshank & Co., 176 Broadway; architect, Henry Dudley.

East Fifty-eighth St., No. 355, four-st'y brick carpenter-shop, tin roof; cost, $8,000; owners and builders, George and John Schmeckenbecher, 238 East Fifty-ninth St.; architect, J. G. Michel.

East Twenty-third St., Nos. 418 *and* 420, two-st'y brick stable on rear, tin roof; cost, $6,000; owner, Henry Maurer, 219 Second Ave.; architect, Oswald Wirz.

Fifty-eighth St., n s, 50′ e Madison Ave., four-st'y brick stable and coach-house, tin roof; cost, $20,000; owner, William McGuire, 154 East Fifty-seventh St.; architect, F. S. Barus.

East One Hundred and Tenth St., No. 203, four-st'y brick tenement with store, tin roof; cost, $8,000; owner, Louis Pieper, 205 East One Hundred and Tenth St.; architect, Bart. Walther.

Ave. A, w s, 16′ n Seventy-fourth St., two-st'y brick stable and carpenter-shop, tin roof; cost, $5,000; owner, Annie E. Kelly, 434 East Seventy-fifth St.; architect, G. A. Schellenger.

First Ave., s e cor. Seventieth St., six-st'y brick factory, tin roof; cost, $60,000; owners, Bondy & Lederer, 56 East Sixty-eighth St. and 241 East Forty-ninth St.; architects, Schwarzmann & Buchman.

First Ave., e s, 46′ 5″ s Seventieth St., 2 five-st'y brick tenements, tin roofs; cost, each, $16,500; owner, etc., same as last.

Seventieth St., s s, 110′ e First Ave., 2 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, etc., same as last.

Fourth Ave., Nos. 1382 *to* 1386, w s, between Seventy-eighth and Seventy-ninth Sts., 3 four-st'y brick dwells., tin roofs; cost, each, $15,000; owner and architect, Anson Squires, 100 East Seventy-eighth St.

Sixty-ninth St., n s, 125′ w Fourth Ave., 3 five-st'y brick dwells., tin roofs; cost, each, about $16,000; owner, Union Theological Seminary (M. Kingsley, Treasurer), Sixty-ninth St. and Fourth Ave.; architects, Wm. A. Potter and J. B. Lord.

Eightieth St., n s, 106′ e First Ave., 7 five-st'y brick tenements, tin roofs; cost, each, $18,500; owner, H. H. Bowman, 243 Division St., Paterson, N. J.; architect, George Chew; builders, John Askey and J. A. O'Connor & Co.

East One Hundred and Sixth St., No. 212, five-st'y brick tenement, tin roof; cost, $10,000; owner, Otto Ebel, on premises; architects, Berger & Baylies.

One Hundred and Second St., s s, 345′ e First Ave., two-st'y front and one-st'y rear shop and tenement, tin roof; cost, $4,000; owner, Patrick Hogan, 302 East One Hundred and Seventh St.; architect, Andrew Spence.

Madison Ave., No. 781, four-st'y brick dwell., tin, tiled and slate roof; cost, $21,500; owner, E. Guilbert, 787 Madison Ave.; architect, R. H. Robertson; builders, L. N. Crow and Jeans & Taylor.

West Seventy-first St., Nos. 547 *to* 557, 6 four-st'y brick dwells., tin and tile roofing; cost, each, about $11,500; owners, Fonner & Lowther, 841 Broadway; architect, E. L. Angell; builders, Stewart & Devlin and Lewis Botchaet.

Ninety-fifth St., s s, 236′ e Tenth Ave., 6 three-st'y brick dwells., tin roofs; cost, each, $10,000; owner, architect and builder, Wm. J. Merritt, 152 West One Hundred and Twenty-seventh St.

Ninety-seventh St., n s, 500′ w Eighth Ave., 6 three-st'y brick dwells., tin roofs; cost, each, $12,000; owner, Franklin E. Robinson, 97 Sixth Ave., Brooklyn, E. D.; architect and builder, Wm. J. Merritt, 152 West One Hundred and Twenty-seventh St.

Ninety-ninth St., s s, 100′ e Grand Boulevard, five-st'y brick tenement, tin roof; cost, $18,000; owner, J. F. Dunker, One Hundred and Twenty-fifth St. and Tenth Ave.; architect, Adam Munch.

One Hundred and Twenty-third St., n e cor. St. Nicholas Ave., 5 three and four st'y brick dwells., tin roofs; cost, three $10,000 each and two $12,000 each; owner, H. Josephine Wilson, 325 East Fourteenth St; architect, D. T. Atwood; builder, Robert Wilson.

West One Hundred and Twenty-fourth St., Nos. 226 *and* 228, 2 five-st'y brick (stone-front) tenements, with stores, tin roofs; total cost, about $36,000; owner, Fernando Yost, 316 East One Hundred and Twenty-fifth St.; architect, Andrew Spence.

One Hundred and Twenty-ninth St., n s, 160′ e Fifth Ave., 3 three-st'y brick dwells., tin roofs; cost, each, $5,500; owner, John W. Auken, 873 Broadway; architect, W. B. Tuthill; builders, Robinson & McDowell, Stapleton, N. Y.

Tenth Ave., n w cor. Manhattan St., 3 five-st'y brick tenements, tin roofs; total cost, $33,000; owner, John Becker, Tenth Ave., cor. Manhattan St.; architects, Babcock & McEvoy.

Tenth Ave., e s, 49′ n One Hundred and Fifty-sixth St., three-st'y frame dwell., tin roof; cost, $5,200; owner, Martin Sponlein, One Hundred and Thirty-seventh St., cor. St. Nicholas Ave.; architect, Wm. Kusche.

North Third Ave., s w cor. One Hundred and Forty-eighth St., four-st'y brick tenement with store, tin roof; cost, $14,000; owner, Ferdinand Hecht, 507 North Third Ave.; architect, A. Pfeiffer.

Alterations.—*Bowery No.* 233, internal alterations and repairs; cost, $3,000 to $4,000; agents, Cruikshank & Co., 176 Broadway; architect, H. Dudley.

First Ave., No. 112, attic raised to full story, one-st'y brick extension, tin roof; cost, $4,000; owner, Bernhard Westheimer, 91 Ave. C; architect, J. Boekell.

Lexington Ave., w s, bet. Forty-first and Forty-second Sts., rooms built of brick for storage purposes; cost, $6,000; owners, Manhattan Storage and Warehouse Co., Forty-second St. and Lexington Ave.; architect, R. Bliss; builder, R. Deeves.

Madison Ave., Nos. 777 *and* 779, one-st'y stone extension, tin and slate roof; cost, $7,000; rector, Edwin Guilbert, 787 Madison Ave.; architect, R. H. Robertson; builders, L. N. Crow and Jeans & Taylor.

East Twenty-third St., No. 418, front of first story rebuilt; also, internal alterations; cost, $4,000; owner, Henry Manrer, 219 Second Ave.; architect, O. Wirz; builder, not selected.

East Forty-fourth St., No. 6, main building and extension, each raised one-st'y; cost, $6,000 to $7,000; owner, John S. White, on premises; architects, C. Buek & Co.; builders, W. Cowen & Son and A. Campbell.

Water St., No. 229, attic raised to full story; also five-st'y brick extension, tin roof; cost, $5,000; owner, Geo. Starrett, 60 Hancock St., Brooklyn; architect, C. Hartwell; builders, P. Tostevin's Sons and G. Culgin.

Philadelphia.

Building Permits. — *Emerald St.*, s of Tioga St., 12 two-st'y houses, 16′ x 30′; Ed. Develin, owner.

Warnock St., above Germantown Ave., 4 three-st'y houses, 15′ x 40′; Wm. K. Sullen, owner.

Aspen St., w of Thirty-eighth St., 19 two-st'y dwells., 14′ x 28′; N. Shoemaker, contractor.

Highland Ave., w of Twenty-eighth St., three-st'y dwell., 16′ x 41′; Jouirson Bros., contractors.

Twelfth St., n of Lehigh Ave., one-st'y chapel, 50′ x 50′; H. M. Martin, contractor.

Germantown Ave., n of Butler St., one-st'y chapel, 36′ x 65′; B. Walker, contractor.

Logan St., w of Seybert St., 4 two-st'y dwells., 14′ x 28′; B. Walker, contractor.

Sixty-first St., s of Pine St., 3 two-st'y dwells., 16′ x 44′; Jno. Pratt, contractor.

Eighteenth St., n of Race St., alteration, 44′ x 60′; E. F. Durang, architect and builder.

Victoria St., bet. Lambert and Richmond Sts., two-st'y dwell., 14′ x 42′; Cliss Dear, contractor.

Front St., n of Alleghany Ave., 2 two-st'y dwells., 12′ x 32′; H. Barraclough, contractor.

Sixth St., n w cor. Vine Hall, three-st'y dwell., 65′ 9″ x 84′; C. C. Carman, contractor.

Alaska St., w of Sixth St., two-st'y bath-house, 16′ x 65′; J. G. Ruff, contractor.

Woodland Ave., w of Sixty-seventh St., 2 three-st'y dwells., 18′ 6″ x 48′; G. N. Crumbach, contractor.

Sixth St., n of York St., 2 three-st'y dwells., 17′ x 45′; D. B. Wendell, owner.

Morris St., n of Queen St., 4 two-st'y dwells., 12′ 6″ x 28′; J. W. Hewis, owner.

Kensington Ave., near Cambria St., 4 three-st'y dwells., 15′ x 52′; S. Brown, contractor.

Ruth St., near Cambria St., 5 two-st'y dwells., 12′ x 40′; S. Brown, contractor.

Marston St., w of Twenty-first St., 10 two-st'y dwells., 16′ x 28′; H. Coulomb, owner.

Adams St., e of Terrace St., two-st'y dwell., 18′ x 45′; A. Rutter, contractor.

Main St., near Mechling St., two-st'y dwell., 20′ x 68′; T. Shustis, contractor.

Fifty-third St., n of Girard Ave., 2 two-st'y dwells., 14′ x 31′; R. Dobbard, owner.

St. Louis.

Building Permits. — Seventy-six permits have been issued since our last report, twenty of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Mrs. B. A. Kretzer, 3 adjoining two-st'y tenements, cost, $7,000; Thos. Kelly & Co., contractors.

A. D. Fassell, two-st'y brick dwell.; cost, $3,000; Thos. Kelly & Co., contractors.

Mt. Calvary Episcopal Church, one-st'y brick addition to church; cost, $10,000; sub-let.

John Dwyer, 2 adjacent two-st'y brick dwells.; cost, $2,500; John Dwyer, contractor.

W. Kealing, two-st'y double brick store and rooms above; cost, $6,000; F. Capitain, architect; P. Brennah, contractor.

Henry Sayers, 3 adjacent three-st'y brick stores and rooms above; cost, $15,000; J. B. McElfatrick & Son, architects; N. S. Wickwire, contractor.

H. Fritsche, two-st'y brick store and rooms above; cost, $3,000; J. Shulte, contractor.

Judge W. C. Jones, two-st'y brick dwell.; cost, $7,000; F. J. Capitain, architect; W. J. Hegel, contractor.

W. J. Beattie, two-st'y brick dwell.; cost, $3,000; W. J. Beattie, contractor.

Chas. Hoffman, three-st'y double brick store and rooms above; cost, $11,080; Aug. Beinke & Co., architects; Hermann & Schumacher, contractors.

M. A. Rosenblatt, three-st'y brick store and flats; cost, $50,000; N. S. Wickwire, contractor.

A. Voeltz, two-st'y double brick tenement; cost, $5,000; C. F. May, architect; H Drees, contractor.

F. Hanse, two-st'y brick dwell.; cost, $2,500; F. Hanse, contractor.

John A. Wohlfinger, two-st'y double brick tenement; cost, $7,000; Ed. Thomssen, contractor.

M. Sheahan, two-st'y brick dwell.; cost, $3,000; F. Mueller, contractor.

Chas. Fuehner, one-and-three-st'y store and dwell. and shop; cost, $4,500; P. F. Meagher & Son, architects; Wm. Popp, contractor.

R. Smith, two-st'y brick dwell.; cost, $2,560; Thos. Roach, contractor.

Fred. Hettinger, 2 adjacent two-st'y tenements; cost, $8,000; A. Beinke & Co., architects; Thomas Roach, contractor.

J. G. Hanausky, two-st'y brick dwell.; cost, $2,600; T. B. Annan, architect; J. G. Hanausky, contractor.

Wm. Gahl, two-st'y brick dwell.; cost, $4,000; A. Whrl, contractor.

P. Schumacher, two-st'y brick dwell.; cost, $2,600; A. Whrl, contractor.

Chas. Rahing, two-st'y brick dwell.; cost, $4,000; A. Beinke & Co., architects; H. Schulte, contractor.

W. Jos. Gannon, two-st'y brick dwell.; cost, $3,900; J. G. Cairns, architect; Dr. Cregan, contractor.

H. A. Steinwander, two-st'y brick dwell.; cost, $3,500; E. C. Janssen, architect; Remmers & Thompson, contractors.

St. Paul, Minn.

Building Permits. — Two-st'y frame dwell., s s of Bluff St., bet. St. Peter and Rice Sts.; cost, $2,400; owner, E. L. Makorn.

Two-st'y frame double dwell., n s of Dayton Ave., bet. Kent and Dale Sts.; cost, $4,900; owner, Emma E. Tenny.

Alteration and repair two-st'y brick dwell., w s of Farrington Ave., bet. Laurel and Summit Sts.; cost, $2,700; owner, J. M. Rogers.

Two-st'y brick veneer double store and dwell., n s of West Seventh St., bet. James and Randolph Sts.; cost, $4,500; owner, Edward Hammer.

Two-st'y frame dwell., w s of Nina St., bet. Selby and Laurel Sts.; cost, $5,000; owner, G. Dressel.

Two-st'y frame dwell., w s of Josette St., bet. Nelson and Iglehart Sts.; cost, $4,600; owner, C. V. McKey.

Two-st'y stone electric-light building, s s of Washington St., bet. Eagle and Ontario Sts.; cost, $7,500; owner, St. Paul Gas Light Co.

COMPETITION.

COUNTY JAIL. **[At Montgomery, Ala.]**

Office of the Board of Revenue,
of Montgomery County,
Montgomery, Ala., July 6, 1885.

Plans and specifications for the construction of a jail in the city of Montgomery, Ala., will be received by the Board of Revenue, of Montgomery County, **until Monday, July 27th, 1885, at 12 m.**

Said jail to hold at least 100 inmates, and contain office and 4 rooms for jailor, kitchen, dining-room, hospital, misdemeanant and solitary cells for both male and female, whites and blacks separate, heating, ventilating and water arrangements, all after the modern improvements.

Length of building not to exceed 100′, and width not more than 44′. This provides for light on each side of the building. Size of lot 50′ x 160′.

The building to cost not more than $35,000.

The successful architect to receive 2 per cent on the cost of the building.

The Board of Revenue reserves the right to reject any and all plans and specifications.

By order of the Board of Revenue.

499 W. H. HUBBARD, Clerk.

PROPOSALS.

FIRE-PROOF BUILDING FOR ARMY MEDICAL MUSEUM AND LIBRARY. **[At Washington, D. C.]**

Washington, D. C., 612 Seventeenth St.,
July 9, 1885.

Sealed proposals for the erection of a fire-proof building for the Army Medical Museum and Library, to be three-st'y in height, with basement and attic, to cover about 23,000 square feet of surface, and to be located at the s e cor. of the Smithsonian Grounds, will be received at this office **until August 7th, 1885, at 12 m.**, and opened immediately thereafter in the presence of bidders.

Specifications, general instructions to bidders, and blank forms of proposal will be furnished on application to this office. THOS. LINCOLN CASEY,

500 Colonel, Corps of Engineers.

CARPETS. **[At Washington, D. C.]**

Treasury Department,
Washington, D. C., June 17, 1885.

Sealed proposals will be received at this department **until 2 o'clock, p.m., Tuesday, July 21, 1885,** for supplying 10,000 yards of Brussels and Wilton carpet, with the necessary border for the same, and 8,000 yards of carpet lining for U. S. public buildings during the fiscal year ending June 30, 1886.

No bid will be considered unless made by a manufacturer or regular dealer in carpets, and accompanied by a deposit of $1,000.

The department reserve the right to increase or decrease the quantity, and to reject any or all bids, or parts of bids, and to waive defects.

499 DANIEL MANNING, Secretary.

CEMENT. **[At Nat'l Military Home, O.]**

June 24, 1885.

Sealed proposals, with a copy of this advertisement attached, will be received at the Treasurer's office **until 2 p.m., July 28, 1885,** for supplying and delivering at this Home, free of freight and all other charges, the following-named stores, to wit: —

450 bbls. (more or less) Louisville cement, best quality.

1,600 bushels (more or less) unslacked fresh lime, in bulk, for purifying gas.

1,100 bushels (more or less) unslacked lime, in bulk, for builders' use.

40,000 lbs. (more or less) sal soda in casks.

16,000 lbs. (more or less) borax chip soap in barrels.

The cement in car-load lots, and the lime in smaller lots, as ordered.

The chip soap, one-half in the beginning of August, 1885, and the balance in the early part of January, 1886.

The sal soda, one-half in October, 1885, and the balance in February, 1886.

All goods must be first-class in every respect.

The Home reserves the right to reject any or all proposals, or to divide the contract between two or more bidders.

A sufficient bond will be required from the successful bidders, and in addition ten per cent of contract price will be retained from each payment until the contract shall have been completed.

Blank forms of bids will be furnished on application to Treasurer's office.

Envelopes containing proposals should be indorsed "Proposals for (name of goods bid upon)," and addressed to the undersigned. J. B. THOMAS,

Treasurer.

P.O. address, National Military Home, O. 498

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. NO. 499.

JULY 18, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE new building law for the city of New York, which has just been published, proves to be in many respects better and more convenient than that which it supersedes; and although we are rather disappointed to find that some of the improvements which might have been adopted have not been, the statute, on the whole, marks a decided advance in the official regulation of construction in this country. Among its other merits, the text of the new law embodies many regulations and decisions of the Inspector, which have hitherto formed, so to speak, a part of the common law in regard to building operations, but, not appearing in the official edition of the statute, were only to be learned by architects at the expense of a good deal of trouble and annoyance; and these, particularly the younger ones, will be glad to have at least the greater part of what they are expected to know presented to them in shape for use. One of the principal points of difference between the new and the old law relates to the thickness of brick walls; stone walls, by the way, being entirely ignored in both laws. According to the former statute, no authority could be obtained for building any brick walls less than twelve inches in thickness. The powers of the law seem to have assumed that no New Yorker, however poor, would condescend to live in anything less imposing than a four-story house; and they obliged the builder of a house ten feet high to make all the walls exactly as thick as if it were fifty-five feet high. This provision, by unreasonably increasing the cost of small dwellings, has undoubtedly tended strongly to drive the poorer people of the city into the tenement-houses, which form the reproach of New York; and the new law, very wisely, as we think, modifies the rule so far as to allow houses not more than twenty feet wide, and thirty feet high, to be built with eight-inch walls above the basement, and blocks of houses twelve and one-half feet wide, and not over fifty feet high may be built with every alternate party-wall eight inches thick. There is no question that an eight-inch wall, which is, in proportion to its mass, the strongest wall which can be built with bricks, possesses ample strength, if properly built, for carrying the floors and roof of a dwelling house of such modest dimensions; and although the brick-makers may regret the change, hundreds of independent and home-loving workingmen will welcome it as bestowing upon them the long-desired privilege of building and owning houses on terms as favorable as those which their brethren in Philadelphia and other cities enjoy.

FOR dwelling-houses of more ambitious character the new rules require walls in some cases thicker and in others thinner than those specified in the old law. The gradation of thicknesses is, however, made with much more discrimination than under the old law, and the future high dwelling-houses will have walls at once less expensive, lighter and stronger than those of similar buildings constructed under the recent regulations. If we take as an example an apartment-house with walls one hundred and ten feet high, we find that under the old law all the walls would be required to be twenty-four inches thick to a height of seventy feet above the curb, and twenty inches thick from that point to the top, making the average thickness above the curb twenty-two and fifty-five one-hundredths inches; while the same walls under the new law would be twenty-eight inches thick to a height of fifteen feet above the curb, twenty-four inches thick thence to a height of sixty feet, then twenty inches thick to a height of ninety feet, and sixteen inches thick from this point to the top. These dimensions actually give a far stronger and more stable wall than those specified in the old regulations, the advantage in strength being, roughly speaking, about seventeen per cent, and in stability at least thirty per cent, yet the average thickness of the wall above the curb on the new model is exactly twenty-two inches, in place of the twenty-two and fifty-five one-hundredths of the old model, and costs, notwithstanding its great superiority, two and one-half per cent less. Similar provisions apply to the walls of warehouses, which are, in general now only required to be four inches thicker than those of dwelling-houses of the same height. These modifications alone in the old law will save many thousands of dollars every year to the owners of real estate in New York, with positive advantage to the general character of construction in the city.

IT is unfortunate that the same care which has been displayed in amending the sections relating to the thickness of walls should not have been employed also upon those regulating the strength of stone, iron and wooden beams; but these, the least praiseworthy sections of the old law, have been retained with nearly all their objectionable features, if not with a few additional ones. In speaking of stone lintels, for instance, both the old and the amended statute specify, without regard to the sort of material employed, that lintels over openings, whether "of stone or iron," shall be not less than eight inches in height for an opening not more than four feet in width, and twelve inches in height for openings not more than six feet in width; and so on; and lintels over openings not more than six feet in width may be of the same height, but four inches only in thickness, provided the opening is covered through the remaining thickness of the wall by a flat arch turned over a wooden lintel. It is needless to point out the absurdity of lumping stone and iron lintels together in this way, as if the materials possessed the same transverse strength; and it is hardly less absurd to specify the same dimensions for all kinds of stone. Every one knows that the transverse strength of stones varies greatly, and while an eight-inch lintel of blue-stone might safely support a wall over a four-foot opening, a similar lintel of many of the sandstones used in New York would be in constant danger of collapse. If the lintel extends only partly through the wall, and is backed by an arch, the danger of breaking it is, although the law does not recognize any difference, much greater than when the lintel is the only support; since the compression of the joints of the arch throws an intensified strain upon the unyielding lintel; and blocks of ordinary building stone of the heights and span specified, would be almost sure to give way sooner or later. The provisions for determining the sizes of wooden floor-beams, though apparently more scientific, are in reality little better than those governing the dimensions of lintels; the new rules, like the old, authorizing in set terms the use of timbers which would, according to the results of recent investigations, break under their load; while even the air of comedy which characterized the old sections on the subject has been maintained in the improved statute by the retention of the ridiculous clause providing that "in all storehouses the weight that each floor will safely sustain upon each superficial foot shall be estimated by the owner thereof, and posted in a conspicuous place on each floor thereof;" just as if any floor would "safely sustain" the same weight upon "each superficial foot;" or as if most owners of storehouses were likely to be able, even if they wished, to "estimate" the strength of their floors by any process more complicated than that of writing down the three figures which first came into their heads.

A LIVELY discussion has been going on in Texas about the stone to be used for the exterior of the new Capitol. Although, as we understand, the contractor for the building is not required by the specification to use local stone, it seems to have been taken for granted that the opportunity of displaying the resources of the State in the way of building stones should be made the most of, and as it was inconceivable that a State of such enormous size should not contain all varieties of stone, the natural inference was that the whole of the materials would be of native origin. Even the contractor appears to have had the same idea, and it was not until

investigation had shown that no stone of good and uniform color was within reach in sufficient quantity to face the walls of the building that he proposed to use Bedford limestone, from Indiana, for the external portions. The question of the use of a foreign stone was brought before the Capitol Commissioners, the majority of whom favored it, but the Governor, who has a very proper preference for granite as a material for large buildings, and, as a member of the Commission, has a right to express his preferences, opposed the conclusion of the majority in a very earnest public protest, taking the ground that although the granite hitherto obtained had not been found quite suitable, further search would undoubtedly bring to light stone enough for the building, of quality in every way unobjectionable. The State, with great liberality, has offered the contractor the labor of a thousand convicts for either one or two years, at a nominal cost, to be used in opening the granite ledges of Burnet County, and in working the stone obtained from them, and has consented to extend the time for the completion of the building as much as may be necessary for making the requisite explorations; and it is not strange that the Governor should believe that everything had been done to insure the use of Texas stone throughout the building, and should be disappointed at the reluctance of the contractor to accept the offers of the State. On the other hand, it is hardly more to be wondered at that the contractor, who probably knows more than the Governor about the uncertainties of stone quarries, and dreads to take any chances in carrying out his agreement, should prefer the certainty of obtaining an admirable stone, in any quantity and within the shortest possible time, at a certain, even if a high price, to the prospect of spending a great deal of time and money in the granite quarries, with only a chance, in the end, of securing stone enough for his wants, possessing the uniformity of color and texture, and the freedom from defects, which are so rarely found combined in granite.

AN Irrigation Commission was recently deputed by the Governments of the various Australian colonies, acting in concert, to examine the methods of irrigation in use in the United States, and report the result of their investigations for the benefit of their own countrymen. Every one knows that in many parts of the West, particularly in California and Colorado, the artificial irrigation of land is carried on in a very scientific manner, and on a large scale, millions of acres of the richest agricultural land in the world depending for their productiveness entirely upon the moisture brought from rivers many miles away, but the methods of irrigation differ greatly in various parts of the country. The system which seems, according to the *Builder*, to have made the greatest impression on the Commissioners was that which they found in use at Pasadena, a noted fruit-raising district near Los Angeles, in Southern California. The distribution of water here is carried on by a stock company, composed of the proprietors who use the water, and each share of stock, costing two hundred and fifty dollars, entitles the owner to a regular supply of water enough to keep ten acres of land in productive condition. The indirect profit on the investment is enormous, for, apart from any dividends which might be earned on the stock by disposing of surplus water to persons not connected with the company, the introduction of the water has increased the value of the land under irrigation more than a hundred-fold, while, even at present prices, the irrigated land is excellent property, the net annual return from an acre of it, when planted with orange trees, being from two hundred and fifty to five hundred dollars, after paying all expenses.

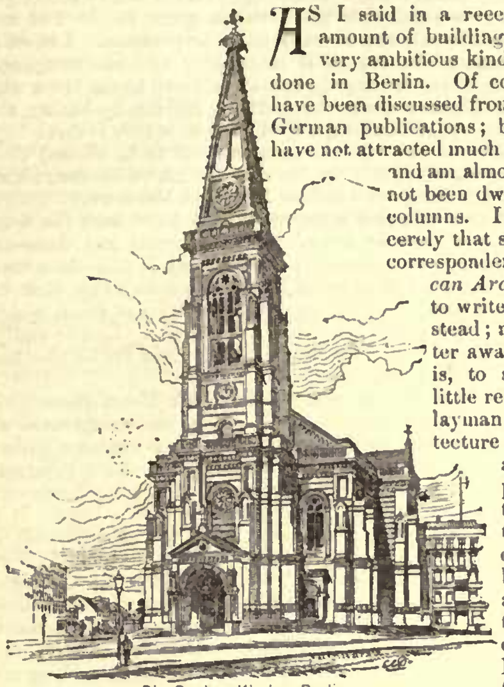
THE supply of water is limited, so that it is necessary to avoid the waste by evaporation and soakage which would take place if it were conveyed in open channels, and in place of these iron pipes are used as conduits. The construction of these pipes is, we think, quite novel, and is certainly well worth remembering. Each separate section is eight feet long, and is formed of two tubes, one within the other, made by rolling up plates of sheet-iron and soldering the joints, which are lapped an inch. The difference in diameter between the outer and inner tube is sufficient to leave a space between them, when one is placed inside the other, of one-sixteenth of an inch, and the two are put together under the surface of a bath of melted asphalt, which not only coats all the surfaces with a protecting film, but forms a continuous packing between the outer and inner tubes, preventing any possibility of leakage, and appreciably increasing the strength of the pipe.

HARPER'S WEEKLY gives an account of a system of accident insurance recently adopted by the Baltimore & Ohio Railroad Company, which is interesting, not only in itself, but as being the first to be carried out on a large scale in this country. The former president of the railroad company, Mr. John W. Garrett, who was a man of exceptional thoughtfulness as well as ability, was struck, when travelling abroad, with the value of the provisions for insuring workmen against accidents which are so commonly made by railway companies and manufacturers there, and on returning to this country he set himself at work to devise a scheme for extending similar benefits to the persons employed by the great railway company whose affairs he administered. His son, who entered warmly into his plans, assisted him in the work, and was therefore well prepared, on his succession, after the death of his father, to the presidency of the road, for the development of the good work which they had begun together. In 1880 the corporation set aside one hundred thousand dollars, as the nucleus of a fund for insuring persons employed in its service against accident, disability or death. All the employés of the company were invited to avail themselves of the advantages offered by this provision, by contributing a small monthly sum for keeping up the guarantee fund, and the subscribers were allowed to share, equally with the railway company, in the management of the insurance association and its funds, by the election of five out of the ten directors. The minimum rate of contribution was fixed at one dollar a month for men receiving thirty-five dollars a month or less as wages, increasing regularly to five dollars a month for those receiving a salary of more than one hundred dollars a month. In case of disabling accident, the men who paid a dollar a month were entitled to draw indemnity at the rate of fifty cents a day for six months, if their inability to work should continue so long, and twenty-five cents a day afterwards, until they were able to return to their tasks, or fifty cents a day for not more than a year, in case of sickness, or injury from other than accidental causes. If one in this class should die of injuries received in the company's service, his family received five hundred dollars; and in the event of his death while in the service, from any cause except accident, his family received one hundred dollars. This series of indemnities was known as a "benefit," and the regular payment of any multiple of one dollar a month entitled the contributor making such payment to a corresponding multiple of the indemnity attached to a single benefit.

AFTER a time, subscription and contribution to the insurance fund, which was at first optional with the employés of the company was made compulsory, on all entering the service, as it is in most cases abroad, and the new workmen in each class now have their contribution deducted from their wages. Each man is, however, allowed the privilege of subscribing for extra benefits if he wishes, so that men who have large families, or a little extra income, may purchase special security for them. In four years and five months, to October 1, 1884, more than seven hundred and fifty thousand dollars had been paid out in indemnities under this system. The largest single item of disbursements was on account of sickness, more than two hundred and seventy-five thousand dollars having been paid for nineteen thousand cases of natural ailments. The next item, as would perhaps be expected on a great railroad, was on account of death by accident, two hundred and one deaths having occurred, involving indemnities amounting to two hundred and seven thousand dollars, and one hundred and fifty-five thousand dollars were paid out on account of indemnities and expenses of surgical treatment for nine thousand cases of injury from accidents. Three hundred and eighty-three deaths from natural causes drew one hundred and thirteen thousand dollars out of the fund, showing that the average number of benefits held by each person is about three. At first sight, the cost of this insurance to those who enjoys its benefits seems rather unreasonably large, the premiums on both life and accident policies for the same sums in companies of the ordinary sort, for men of the average age of those entering the service of a railway company, being only about one half of the contributions required by the Baltimore and Ohio corporation; but it must be remembered that these contributions cover indemnity against sickness, which none of the ordinary insurance companies touch, and which, as it appears, absorbs more than one-third of all the money paid out, and that railroad men, on account of the dangers incident to their profession, always have to pay a much larger premium for insurance than those engaged in other occupations.

BERLIN AND NEW YORK.

BERLIN.


Die Dankes Kirche, Berlin.

AS I said in a recent letter, a vast amount of building, much of it of a very ambitious kind, has lately been done in Berlin. Of course its results have been discussed from time to time in German publications; but I think they have not attracted much attention abroad, and am almost sure they have not been dwelt upon in these columns. I wish very sincerely that some professional correspondent of the *American Architect* were here to write of them in my stead; no one being better aware than I that it is, to say the least, a little reckless for a mere layman to speak of architecture to a professional audience, and especially of contemporary architecture, where he cannot often fall back for guidance and support on the dicta of printed authorities. But Berlin lies so far outside the usual track of the travelling student that I hardly imagine any well-trained observer is likely just now to be looking about him here with the intent to take notes and "mayhap to print 'em" in these columns. And even should such be the case, he certainly will not find his work forestalled by my remarks, which shall be strictly and conscientiously superficial; I having no faintest desire to do more than show how, to a mere interested outsider, the current results of architecture here seem to compare with its current results at home.

As every one knows, there is nothing in the older architecture of Berlin that is first-rate; very little that is even second-rate in quality. There are two or three rather unimportant mediæval churches, and one wing of the palace dates from the sixteenth century, but all else is *baroque* or modern. The secular work of the last century is only pretty good — not half so interesting as that in Dresden or Vienna — while the churches are conspicuously ugly. I will only note as a curiosity that standing free in the Gendarmen Markt, with the theatre between them, one sees a pair of churches, built by Frederic the Great, which are absolutely identical, an architectural inspiration that I do not remember to have seen elsewhere incorporated, and that certainly does not strike one as felicitous.

The Classic style which everywhere came in with this century found here a good exponent in Schinkel. His Schauspielhaus (the Royal Theatre, not the Opera-House) is an excellent example of what can be done with Greek, or more truly by Grecicizing, forms kept free from all Roman intermixture. And his Old Museum is effective and grandiose outside, though within it was as badly planned, both for monumental beauty and for its special purpose as one could well imagine. Owing to Schinkel's enormous influence, and still more, perhaps, to the taste of Frederic William the Fourth, the Classic fashion persisted in Berlin long after all the rest of Germany had been swept into the current of the "national-romantic" movement. Its hold was finally broken only about fifteen years ago, when the present period of great activity began. On the whole, contemporary architects have had almost as good a field here as they have with us. That is to say, if a field is good in proportion as it is open, free from those noble relics of a great period which set an uncomfortably high standard, and to a certain extent mark out the path modern men must take to reach it.

It may be said in general of Berlin, both old and new, that it is a city without visible roofs, to a degree almost if not quite unparalleled in Northern Europe. Nowhere in secular work that is not strictly recent do we see the sign of a roof, save only in the oldest wing of the palace; and even in the recent work the same state of things largely prevails. Among the new shops and apartment-houses one sees, indeed, certain visibly-roofed examples with French mansards or German dormers. And in the villa quarters steep little roofs are getting to be somewhat frequent. But the general aspect of the town is not yet perceptibly modified, and the traditional rule of no roofs has hardly been broken through, I think, in a single one of the many great public structures and private palaces of to-day. This absence of roofs seems doubly strange and doubly unwelcome if one happens to have come from Dresden, where, though the roof is somewhat subordinated in current work, it forms the chief feature in all work that antedates this century — where the oldest streets are crowned with a steep, picturesque mass of red-brown tiles, and the *baroque* buildings offer as charming a series of studies in the use of hipped roofs, often with curved profiles and overhanging eaves, as one could wish to see. Indeed, wherever one may come from, the rooflessness of Berlin strikes one as a disagreeable anomaly in this degree of latitude.

I may add that until within the last few years Berlin was also chiefly a city of stucco. Stone was not a local product, and was dispensed with even on occasions where one might think cost would have been no object, while the example of that beautiful old brick architecture which is the only glory of the Brandenburg Mark was utterly ignored and burnt clay was held fit only to be concealed by plaster. Even now in ordinary structures plaster still rules and stone is a rather rare alternative; but with the growth of wealth and ambition it is winning its way, and stucco has been banished at least from monumental work. Here side by side with a constant use of a pale yellow sandstone, and a more than occasional use of marble and granite, we find a brick Renaissance well under way, and it constitutes, I think, the most interesting because the most individual local feature.

Since I have said that roofs are so exceptional, it will be understood that no favor is shown to Gothic or even to the most characteristically northern early Renaissance forms. Mediæval precedents are consulted only in ecclesiastical work, and in this itself we seldom find even an approach to a thorough-going mediævalism. The general superficial effect of a Gothic church seems to be thought desirable; but round arches are almost invariably used just now, and are never treated in a genuine Romanesque way. When the forms and details are not Renaissance they are "Byzantine," after the fashion of Munich in the last generation. The most amiable of tourists could not say that ecclesiastical work is a strong point with the Berlin school; the most patriotic of critics acknowledges weakness here, and even the most self-satisfied of critics tacitly confesses it. For no one, from the writer of one's guide-book to the driver of one's cab, lays much stress on the attractions of the newer churches, not even of that one — the Dankes-Kirche — which is a monument of popular gratitude for the Emperor's escape from assassination. I am told that the weakness of the local school in this department is especially marked in the matter of reconciling interior arrangement with exterior expression. But I have not been tempted to seek the inside of any of these churches — always a troublesome and time-consuming effort in a Protestant land.


Jerusalemer Kirche, Berlin.

It is the Renaissance which rules unchallenged in Berlin to-day; chiefly in its later forms and until very lately only in its Italian varieties. Richard Lucæ, who at first followed Schinkel's Classical lead, but was afterwards much influenced by Semper's work in more Southern cities, may be named as the pioneer in the Renaissance movement generally, and as the father of its Italianizing branch. To him and to Hitzig are due the first of a long series of public buildings and sumptuous private hotels or "palaces," which are often very excellent examples of one or another of the late Italian types. But as we have similar examples everywhere with us on the Continent, we do not stop to study them here; and still less do we pause over those other palaces which now occasionally show the influence of modern Paris. In both types the sculptor often contributes very largely of his art, but rather to the increase of general sumptuousness than to that of definite artistic charm. And the same must be said of the vivid color-work in paint or mosaic which now is sometimes being added, either on the walls of loggias or in the upper panels of the façades themselves. The Germans of the North are proverbially not colorists *de race*, and one feels — theoretically and from the evidence of these essays, which are sometimes due to their most accomplished painters — that only those who are colorists by nature can succeed in the difficult task of using external figure-paintings on a conspicuous scale as to size, and on the most pronounced and varied scale as to color. A Giorgione could succeed, perhaps a Makart could have succeeded; but to my eyes Professor Werner and his fellows fall a good deal below the mark

that one's imagination is fain to set. And when the same experiment is tried under worse conditions, as sometimes on great public caravansaries and commercial structures, the result is certainly showy enough, but artistically the reverse of inspiriting.

The long new streets of ordinary dwelling-houses (apartment-houses, that is to say, though not in our towering acceptation of the term) are varied by all sorts of essays, from that utilitarian plainness which in Germany is dubbed the "barrack style" to that self-conscious and ponderous elaboration which is so often the result when an average Teuton in any profession tries to be ornate and playful. Modern Paris and Vienna are often copied, but hardly so as to preclude the necessity for studying their ideas at home. The most interesting and the best examples are those, I should say, which have a more German-Renaissance accent, and which hold a middle course between barrenness and ornamental excess; and some of these are very good indeed.

Among the smaller detached dwellings, again — the villas around the Park and in the outlying quarters—time-worn Italian and French modes vie with those of a more "national" character. A modified châlet type is conspicuous, and has brought in the steep roofs of which I spoke. But here there seems to me very little that is interesting: a dead level of work that is rarely bad or unaccomplished, but never, I should say, really beautiful or really suggestive; and, after all, the domestic problems of Berlin are so very different from those of American towns that we should not get much practical help here, even did all examples show the distinctest excellence.

In many streets the shops are of course but a subordinate feature of the apartment-houses; but in others of a more distinctly commercial character we see in fullest force that tendency toward loud display, that desire to be conspicuous at all hazards which we have known so well at home. The general effect of these streets is certainly more imposing than the general effect of similar streets with us. But I do not think the difference springs from any great preponderance here of really better architectural elements. Part of it, and it is a very great degree of difference, as may be guessed, comes from the fact that here an important business street is very wide, beautifully paved, extremely clean, not wholly deformed by rampant signboards, and not hatched over with telegraph-wires. Then everything is brought up to the same high level of — shall I say pretentiousness, while with us pretentious is very apt to stand side by side with humble, shabby and sordid insignificance. But in itself the pretentiousness of Berlin does not seem to me of a quality we need envy. If we examine it in detail we find that it has, indeed, a more "scholarly" character than has been the rule with us, in so far that some recognized style or fashion is the starting-point, or that a mild eclecticism is based upon the elements of such styles. There is none of the crude originality, none of the aberrant inventiveness, none of the bold, fantastic wilfulness which we see expressed, I will say, in the central portion of Broadway, and which were encouraged partly by the free and independent (and ignorant) nature of the American soul, and partly, doubtless, by our more general use of iron. But the result is hardly better, either for true architectural excellence or for superficial beauty; while even hideous originality has perhaps a certain sort of interest that is wanting to unbeautiful conventionality. The general effect is, I repeat, distinctly loud and vulgar. There is an almost entire lack of fundamental architectural ideas, an almost entire dependence upon applied decoration, and a very marked tendency in this decoration to confound profuseness with effectiveness, and over-emphasis with beauty. Even as we stood ten years ago I do not think we need have greatly envied the commercial architecture of Berlin, while as we stand to-day such envy would be most misplaced; for our latest efforts in this branch seem to me far better than anything Berlin has to show, very often better in the spirit which has prompted them, and sometimes much better, also, in their actual concrete presence. The problems here are easier; there is neither the cramped ground-plan of New York, for instance, nor the same tendency towards immoderate height to contend against. And yet, with a greater freedom and freshness of feeling, we also display — unless, indeed, I have no eyes to see — a much more earnest effort to grasp the properly architectural side of the art, a stronger impulse toward structural composition, and a distincter desire to subordinate ornamentation to this. There is with us a rapidly-growing reaction against superficiality of treatment and also against loudness and ostentation. But I see no signs of either in the commercial work of Berlin; I should be inclined to say, on the contrary, that for rampant showiness nothing could ever have been done anywhere in the world to exceed the great new Kaiser Gallerie, with its openings on two principal streets, or than a certain structure of orange-colored brick, with profuse light stone trimmings, that has recently made itself conspicuous on the Unter den Linden.

Doubtless among all the new buildings in the lower part of New York there is not one without its imperfections; and yet there are very many which I am sure every impartial judge would find architecturally better than anything of a similar character here — architecturally better in the motive which has ruled their design, and also more satisfactory to the eye. And it would be ridiculous even to attempt a comparison with such an example as, for instance, the Ames stores in Boston. Of course these of our buildings to which I now refer are still exceptional; but they are increasing in numbers so rapidly that they seem to point to a future rule, and in the commercial work of Berlin we do not find even exceptions of the sort. The only works that even in aim seem to me really good, really architectural, are some of the bank buildings, and these more properly belong to the class I have already named as including the private palaces, since they usually stand outside the main business thoroughfares and follow rich palatial forms, have no great height and are discreetly aristocratic and non-commercial in expression. I have, it is true, seen one shop-front which is interesting and charming, and doubly so because of its entire unlikeness to all else about it: a narrow front which follows a good old German fashion by having the openings of all its upper stories grouped into a square central bay, and its shop-window a real window under a great arch, instead of a mere screen of glass. But this is the only attractive or instructive item I have noted in the great business streets of the town.

The recent revival of brick constitutes, as I have said, the most individual feature in current work. In commercial and domestic structures either a red or a vividly yellow variety is now often used as the groundwork for an ornamentation in stone so lavish that its essential qualities almost disappear, except its quality of color, which is apt to come into spotty and discordant prominence. Rather oddly, it is to the series of new public buildings we must look for its simplest and most straightforward treatment.

Schinkel may be said to have started the brick Renaissance with his Bau Akademie in 1837, though the building was exceptional as regarded his own practice (his other brick essays having been rather unsuccessful Gothic churches), and was without immediate practical influence upon the profession. But it was long and widely discussed, and has had a numerous late-coming progeny in our own times. If I am not mistaken, it is illustrated in Fergusson's "*Modern Architecture;*" but it looks better, I find, on paper than in the body. For, given the necessity, supposed or actual, for a right-lined, four-square ground plan, its design is attractive and appropriate, while its treatment strikes one as thin and poor; the basement not pronounced enough, the angles not solid enough, the buttresses too shallow, the cornice too feeble, the decoration too small in scale and too meagrely mechanical in finish.

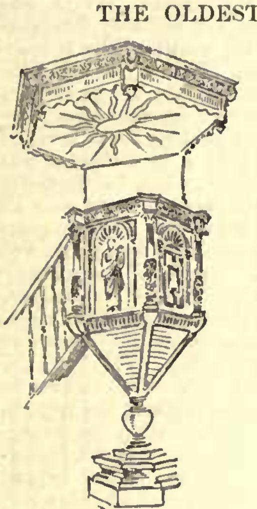
The first conspicuous effort again to bring brick into favor was made by Waesemann in his Rath Haus, finished in 1870, which even local patriots acknowledge to be one of the most colossal architectural failures of an age which is pretty rich in such. Certainly nothing more unscholarly in conception ever arose even on American soil. The artist seems to have tried to preserve an Italian flavor, while basing his work on the great mediæval and Renaissance town-halls of the North. The enormous length of his main façade is broken by pavilions at the angles and in the centre, but they are so small on plan and so shallow in projection that they do not really mitigate the effect of dreary monotony. Above the basement there rises an unbroken succession of very tall, round-headed openings, which, from the evidence of their heavy transoms, seem to light two stories within. But we find to our surprise that for the most part they open with their whole height into very large and lofty apartments. There is no visible roof and but a weak cornice, and the square tower with open angle-turrets, which rises from behind the centre of the façade, is as ugly and wire-drawn in design as it is utterly unconnected with the mass below. The main portion of the structure is red brick, harsh in color and unmitigated in tone, and, since the mass is so devoid of modelling, unrelieved by any effective shadows. The light granite used for the basement and certain parts of the decoration is in rather glaring contrast, and the dark sandstone which is employed only and solely to form the transoms and mullions of the tall windows, having its existence nowhere else suggested, naturally appears to be wood or iron. Inside, too, the building is a total failure, only half-lighted, and very badly planned both for grandeur of effect and for practical convenience. Even the one redeeming point which local critics note in the Rath Haus would hardly strike a foreigner as such — the technical treatment of its brickwork and of its lavishly applied though quite undecorative decoration. This last, partly in stone and partly in terra-cotta, is everywhere designed with the utmost care and academic correctness; but it is very small and ineffective in scale, badly disposed, and very mechanical (at least the terra-cotta) in execution.

The Rath Haus remains an isolated and uncharacteristic example of local work, if we regard its general aspect, its style or no style. But it is locally characteristic if we regard its technique, so to say. The very many recent brick public buildings are all alike in this, that mechanical exactness seems to have been held equivalent to artistic beauty, and that terra-cotta ornament is very freely used, but is very small and ineffective in scale, very flat in relief and very metallic in execution. A four-square, right-lined ground plan is almost invariable; indeed, so far as I have seen, quite invariable in this class of structure. The inspiration as to style comes from north Italy, not, as one might have predicted, from north Germany or Holland. Round arches are universal and their forms are often boldly and effectively modelled, showing, in this point at least, an advance since the days of the Bau Akademie and of the Rath Haus. The proportions of voids to solids is doubtless, of necessity, greater than in Italian brick construction of a similar sort; but there is no attempt to restore the broad, open fields of wall so essential to the material, by any grouping of the windows. Indeed, composition is still the great thing lacking, both in the treatment of the main masses, and in the disposition of wall spaces and openings. The general effect is totally different from that of the loud and showy commercial buildings I have noted; but the same neglect of strictly architectural — that is, constructive beauty, underlies them both. And in consequence

we find, though of course in a very different and infinitely less offensive fashion, the same tendency to the over-use of ornament. Such plain wall spaces as are left are in reality not left, are as much broken up and "enlivened" as possible. In the lower story of the new part of the General Staff Office, for example, there are wide, solid stretches (the only ones in the building) between the windows; but they are lined with horizontal rows of tiny, finikin, tin-like terra-cotta rosettes, until all effect of breadth and strength is lost. The mouldings of the great round-arched windows above are very lavishly embroidered with very scholarly, very pretty, but quite conventional designs of arabesques and figures, wherein, once more, the scale is so small, the relief so flat, and the finish so mechanical that neither by perceptible beauty of line nor by perceptible contrast of light and shadow, do they add a note of really decorative charm.

M. G. VAN RENSSELAER.

THE OLDEST CHURCH IN LONDON.



THE following letter has been addressed to the editor of the New York *Evening Post:* —

Sir, the relation between our nationalities is now so close and so intimate, that an Englishman — especially an English clergyman — feels little or no compunction in asking help of his cousins across the Atlantic for any object which is in any sense of national interest. I therefore beg permission to ask through the medium of your columns for help to restore the oldest church in the city of London, viz.: the Priory Church of St. Bartholomew the Great, West Smithfield. This church was founded in the reign of Henry I., A. D. 1103, by Rahere, founder also of the adjacent Hospital of St Bartholomew. Much of the original building is still standing, and is used for public worship. But apart from the unique and impressive character of the architecture — a beautiful specimen of early Anglo-Norman style — the church and parish possess singular historic interest for Americans and Englishmen. The founder of Emmanuel College, Cambridge — the father of Harvard University — Walter Mildmay, is buried within our walls. Milton lived for some years in our parish. Hogarth was baptized in our font. Benjamin Franklin had his printing-press in our close. Washington Irving lived hard by in Little Britain, and has written one of his most charming descriptions upon its inhabitants. All these great men have doubtless many times worshipped within our walls. The martyrs of Smithfield suffered within twenty yards of our gates on a spot which was originally within our precincts. These associations are precious to all of us, and there is many another page of history upon which our records throw light.

Saint Bartholomew's Church is well-known and keenly appreciated by many American visitors, and I am persuaded it only requires that our purpose should be made clear, to call forth a kindly sympathy and a hearty coöperation from America. A committee has been formed, with the Archbishop of Canterbury and the Bishop of London at its head, to try and buy back the old consecrated sites from secular usage, and to restore the fabric in a maner worthy its history. The ancient lady-chapel is used as a fringe factory, the north transept as a shoeing-forge, the north triforium as a school, while in many places the roof is so faulty and insecure as to let in rain.

A large sum — £20,000 — is necessary to carry out our object; but we are most anxious to raise £7,500 at once to purchase the ancient lady-chapel and the north transept. If this sum is not raised within the present summer, there is a fear that these ancient sites may come to the hammer and be lost to the church forever.

Any help toward these objects will be gratefully received and acknowledged by me. Remittances made to Messrs. Brown, Shipley & Co., Founders Court, Lothbury, or to the Rev. Arthur Lawrence, the rectory, Stockbridge, Mass., would also be kindly accepted by them.

Asking your good offices in this matter, I am, sir, your obedient servant, W. PANCKRIDGE, Rector.

THE VESTRY, ST. BARTHOLOMEW THE GREAT,
WEST SMITHFIELD, June 25.

MARMORINE, A SUBSTITUTE FOR MARBLE. — Mr. Bruce Joy, an English sculptor, has invented a new material for statuary which he calls marmorine. It is said to be as beautiful as marble, and scarcely distinguishable from some tints of Carrara marble, yet much cheaper than marble, and having the advantage of limitless production from an original. Though cheaper than marble, it is still costly, which will prevent its being used in inferior forms of art. Though something like plaster-of-Paris, it is so hard that it may be worked upon precisely the same as marble. — *Exchange.*

SOME CATHEDRALS OF SCANDINAVIA.



THE northernmost and unquestionably the finest of Scandinavian churches stands at Throndhjem, in Norway, the highest point to which a railway attains in Europe. It is a vast edifice now undergoing restoration, but has hardly yet emerged from a state of ruin. Here the Norwegian sovereigns are crowned, and here at one time the Assembly used to meet on occasions of national importance; but scaffolding and sustaining walls still occupy much of the great Church of St. Olaf, and make it useless at present to invite anybody's company to so remote a region. Let us, then, pause at Upsala on the way thither from Stockholm.

Upsala can be reached by land or by water from the Swedish capital. The railway journey occupies a little over two hours, and the steamer is about twice as long in doing the distance; but the land route is intolerably wearisome, through endless and dreary pine-woods, while the water journey is pleasant and picturesque, affording, as it does, peeps at the shrunken ruins of Ligtuna and the imposing square château at Skokloster. The old University city itself stands on both sides of a narrow, muddy stream, called the Fyrisa, into which the steamer very slowly and not without considerable difficulty makes its way from an inlet of Lake Mälaren, and the paddle-wheels churn up the clayey soil at the bottom as we pass under a very hideous red building called locally the Slott, or Castle, and bring-to at the quay of Upsala, beyond which point the winding little river ceases to be navigable at all. The most prominent building here is the cathedral — a strictly Gothic structure in red brick, with occasional inlaid patterns of white stone, of which the speckled effect is by no means an improvement. The exterior is in other respects very plain, there being little in the row of lateral chapels to break the line of the aisles, — indeed the effect produced is rather as of a double aisle — the transept being shallow, and the two western towers not sufficiently high to impress the imagination. The architects of the period were not such masters of their craft as the mediæval builders at Lübeck and Nuremberg, in whose hands we learn of what brick is capable, and the only ornament to be discovered at Upsala is on the elaborate and pleasing portals north and south. Inside, the church is at first sight very disappointing, owing to the bare condition of its white-washed walls and roof, and the absence of all colored glass; but when we have somewhat got over this feeling we cannot choose but admire the proportions, which are really very striking. Twenty-four columns support the nave and choir — a total length of nearly four hundred feet — and the capitals of these columns, whose quaintly-conceived animal-forms are carved in the highest relief, are most curious. Some massive candelabra, and the pulpit, a top-heavy wooden erection, covered with paint and tawdry gilding, complete the decoration of the nave; but a valuable sarcophagus conceals the bones of the sainted King Erik, and two memorial chapels enclose monuments of historic and artistic interest which might not improbably be better appreciated by foreign visitors if the sacristan's knowledge of languages was not confined to Swedish. In one of these, under a vaulted and staring canopy of blue, dotted with golden stars, reposes Gustavus Vasa; in the other the fine Italian tomb of John III is placed. More interesting than either, in a small side chapel across the nave, with no wretched modern frescoes to grieve the eye, and no false and unseemly ornament to detract from the dignity of death, rises an obelisk of porphyry, on which a medallion exhibits the lineaments of the greatest Swede of later days, Linnæus, who is buried beneath the nave. The treasury contains a large amount of rubbish, and a certain banner — said to have been made by an early queen out of her petticoat, and sent in derision to a German potentate, who had scoffed at her war-like propensities — of which the natives are very proud: we were unfortunately unable to discover it among the mass of old vestments and relics deposited there.

At one time three lofty towers, four hundred feet high, gave grandeur to Upsala Cathedral; but the ravages of a fire in 1702 destroyed them, and the central tower has never been rebuilt. The two that now flank the front have only been carried up one hundred and eighty feet high, just double the height of the choir, and their effect cannot be compared with those at Lund in South Sweden, which, owing to the wide extent of the flat plain that encircles the city, can be seen from an immense distance, and have scarcely faded out of sight of the Danish steamboat when it reaches Copenhagen from Malmö, a site well chosen for what was once the metropolitan church of Scandinavia, though Denmark has now its own archbishopric, and the primacy of Sweden has been shifted to Upsala.

Lund is a fairly lively little town not far from the southern extremity of Sweden, and the seat of one of the Universities of the country. In the sixteenth century its population was nearly twenty times what it can boast now-a-days, for including students the total is under fifteen thousand; but the town has shrunk with the population, and we do not see ruined walls or crumbling buildings around to remind us of the changes that have befallen it. Its glory is the Cathedral, a small but very pleasing Romanesque building, nearly one hundred feet

shorter in length than the Upsala church; but, owing to the difference in level between the nave and transepts, and the perspective through the double row of columns, the impression upon the mind is as of a much larger edifice. The east end has a circular apse, and beneath this is a vast crypt, resting on twenty-four pillars, which is carried for a length of one hundred and twenty feet or so under the raised portion of the Cathedral; and here are quaint old stone figures, strange brasses, and forgotten tombstones to be seen when the sun streams down from the open doorway above, or through some of the lateral chinks, which on a dull day can scarcely do more than make the darkness visible. The vaulting of the Cathedral throughout is elaborately painted in blue and gold; and, though the result is somewhat glaring at present while the color is being renewed, it will doubtless harmonize in years to come well enough with the walls: and at any rate, this coloring is preferable to the depressing whitewash which appals the visitor to Upsala. There is much to note with pleasure and surprise in this little Cathedral. In one place we see some curious winged lions, supporting on their backs angels in the act of unfolding their pinions to fly away, and, damaged as the stonework is, there is much spirit in the sculpture left. In another we find great brass candelabra surmounted by saintly figures, which also rest on small lions, and above there are raised slender columns to support deeply-cut rounded arches sunk in the thickness of the walls. Again, the carving of the wooden choir-stalls is delightful. It represents the chase of a nondescript animal, half bear, half beaver, who is alternately hunter and hunted, and on one stall is being dragged from his den by the tail, while a little further on a larger specimen of the beast is satisfactorily munching his human adversary. But the lover of architecture will probably be most interested in noticing the extreme diversity in form and ornament of the solid pillars that bear the crypt; their capitals, now plain, now richly sculptured; the little figures that crawl up one; the very unusual double-rope marking of another; and the deep indentation that is carried from base to capital of a third; and all supply a fitting framework for the strange medley of tombs, fragments of stone and iron work, to be found gathered together below and around them.

The growing seaport of Malmö is but a few miles from Lund. This town possesses several large brick churches whose proportions are good enough, but spoiled as usual, inside, by dreary whitewash; yet, in spite of the importance of the place, none of these rises to the dignity of a cathedral, and the first to be seen worthy of note on the way southwards after leaving Lund is the royal burial-place of Roeskilde in Denmark, for the great Frauenkirche of Copenhagen is only redeemed — though nobly — from ugly insignificance by the masterpieces of Thorwaldsen that adorn it without and within.

Roeskilde is about seventeen miles distant from Copenhagen; a journey that the railway contrives to accomplish in something under an hour-and-a-half. It is a dreary town enough; but the situation is pretty, as it lies in a grassy plain at the head of the inlet of the North Sea, and a gradual rise from every side culminates in a plateau on which the Cathedral stands, so that without being on a height in any fair sense of the word, its slight elevation makes it visible for a long distance. The Cathedral is a very small building, first consecrated in 1084, at a time when the rounded arch had not yet made way for the pointed variety; but, as repeated conflagrations destroyed portions of the edifice, the ruins were rebuilt in the newer style. The transepts do not project at all from the body of the church, and the aisle on either side the nave is carried around the choir. Hence the whole building presents a rather monotonous appearance when seen from the outside, which, moreover, suffers from the presence of a pigmy pinnacle or so in place of any spire or tower, and from the new pointing to its old brick surface applied during a recent restoration. Inside along the southern aisle is a row of chapels containing huge sarcophagi in black and silver, and tasteless monuments where repose the past Kings of Denmark. The effect of these is overwhelmingly dismal. The chapels are scarcely in harmony with the original design, though here and there a good individual detail is noticeable, such as the vaulting springing from a central shafted column, or the cupola that caps a dome elsewhere. In one may be noticed some old frescoes that might have been interesting had they not been ruined by successive layers of whitewash or injudicious renovation. The largest of these chapels contains the tomb of Christian IV with his wife by his side; and he, almost alone among the sovereigns of the little Northern Kingdom, seems to have merited much posthumous honor by his wisdom in counsel as well as his bravery in war. He befriended art in all its forms, and most of the best architectural work in the country dates from his time; nor did he, like too many of those who preceded and succeeded him on the Danish throne, waste the finances of his kingdom on useless frivolities, or in gratifying the whims of worthless favorites. Yet others may be lying here whose memory should be rescued from oblivion, as underneath the upper choir — for at Roeskilde there is a division of the choir, and one portion is raised above the surface of the other — lie buried many of the early kings and magnates of the land, whose names are at this time little but a myth at home, and are altogether unknown abroad. The choir is enclosed by a very handsome old brass railing, and there is some fine carving on the altar itself, and upon the choir-stalls. But, on the whole, a pilgrimage to Roeskilde cannot be said to have the same interest, except for the specialist in Danish history, as the journey up the lovely arm of Lake Mälaren to Upsala, or groping in the semi-darkness of the grand old crypt at Lund.

The town is absolutely without interest; it is also without what hungry visitors would much desire to find in it — a good restaurant. The railway, too, seems to crawl back to Copenhagen more slowly than it comes from it, but as soon as one reaches the pleasant Danish capital equanimity is speedily restored. — *The Saturday Review.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

SKETCHES IN WETHERSFIELD, CONN. BY MELVIN P. HAPGOOD, ARCHITECT, HARTFORD, CONN.

WETHERSFIELD is a quiet but handsome village four miles from Hartford, on the banks of the Connecticut River, and much of the fertile land is occupied by seed-gardens, whose products — in small parcels — have found their way over the whole world. There is a tradition that the Wethersfield church was largely paid for by a special sale of onions, and certainly this odorous vegetable has greatly contributed to the wealth of the community. In 1838 the floor of the church was lifted to give space for furnaces in the cellar, and the high pulpit and the box-pews were removed. The wainscoting of the latter served for more than forty years as a fence for a neighboring estate, and the long line of bevelled panels had a very handsome effect. In 1883 a new chancel was built to contain the organ, and the south gallery, which had formerly upheld it, was removed. The side galleries were lowered, and all the wood-work in the lower part of the church was put into quartered oak. The floor was inclined down towards the new pulpit and the new oak pews arranged semicircularly. A series of long stained-glass windows took the place of the two stories of short windows, and as the old sills were near the floor, in consequence of the elevation of 1838, carved stone panels were inserted on the outside to raise the new sills to the height of the wainscoting. This, with the south porch, makes the only external change from its appearance in 1761. The middle cornice of the auditorium, marking the ledge in the old wall, with the Ionic pilasters above, supporting the ceiling-beams, are painted ivory color, and the wall spaces between, including window splays, are saffron, with *fleurs-de-lis* in dull copper bronze. The ceiling panels are in neutral blue, with an ochre border, relieved with a Greek fret in ivory. The organ-loft is painted Indian red, with an anthemion border around the ceiling. The lower part of the walls is in deep olive, harmonizing admirably with the oak, and just above the wainscot is a broad band of dull gold. The vestibules are painted Indian red, with brownish-ochre ceilings; ivory cornices. The stained-glass, which, as well as the frescoing, was designed by the architect, has its principal field of blended tones of amber and yellowish olive, with some bands of deep red. In the upper sections, Scriptural texts are in yellow enamel on neutral blue grounds, with the surrounding rays in yellow and brown. The upper circles are cut-glass "sun-bursts" with a border of amber jewels. To harmonize with surrounding structures, nearly all of which are white, with green blinds, the steeple, cornices, and all other salient features are painted white, with the wall-surface pale sage-green, and the sashes, both inside and out, dark bronze-green, and the effect of the whole is very pleasing. Formerly the walls were lead-color, with chocolate trimmings, but the dark color greatly obscured the delicate mouldings and carving of the upper surfaces, and the bluish lead-color clashed with the greensward and the elms.

PALAZZO LOREDAN, OR VENDRAMIN-CALERGI, VENICE.

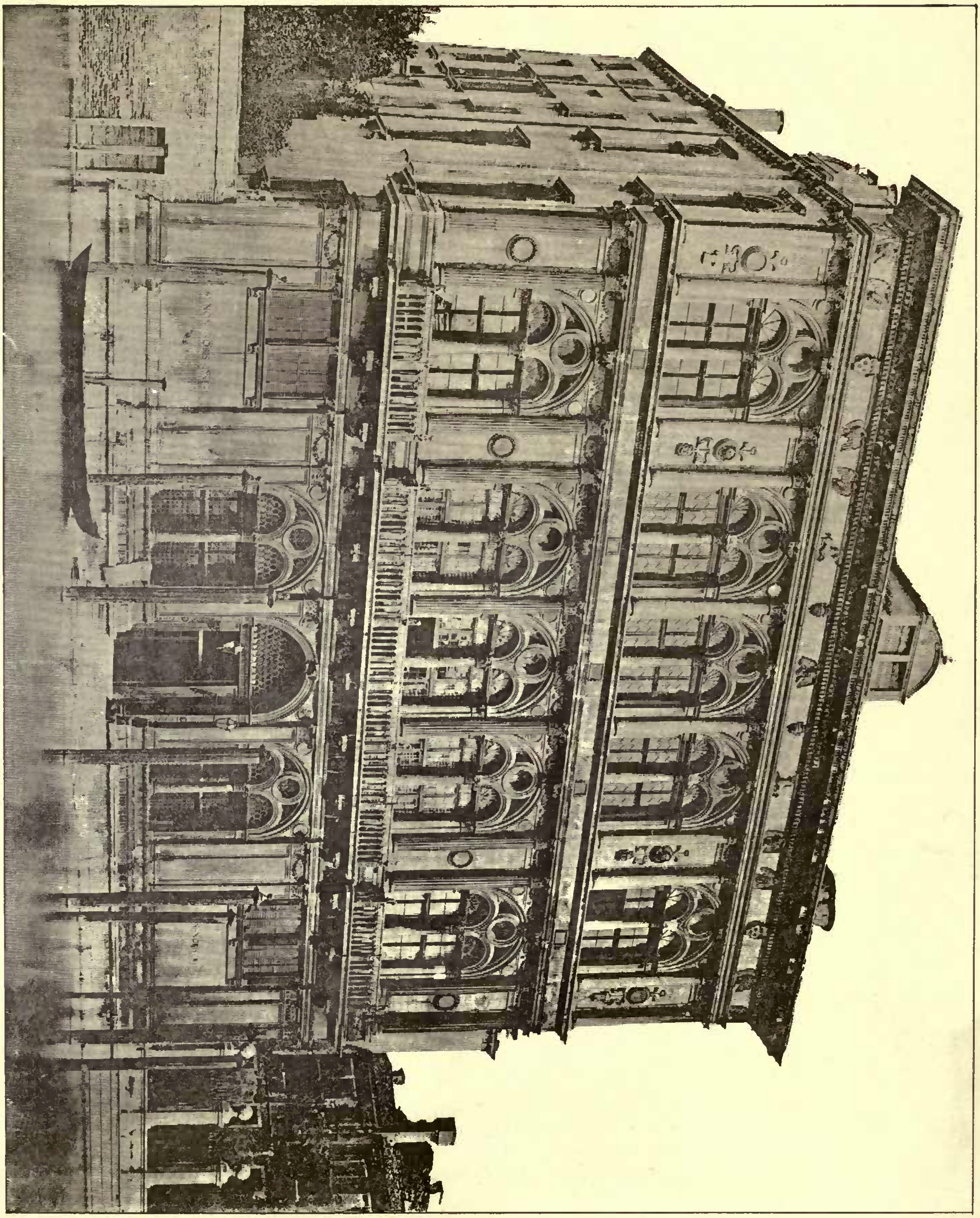
This palace was built for the Doge Andrea Loredano, about the year 1481, perhaps by one of the Lombardi. Sansovino esteemed it among the four most magnificent palaces in Venice, being covered with Greek marbles, and having its large windows decorated with Corinthian columns. Though built by a Loredan, it was more popularly known as "*palazzo del non nobis*" (the palace of the not to us), because of the inscription: "*Non nobis Domine, non nobis*," engraved along its basement. Another inscription may be read on the small tablets decorating the jambs of the central water-entrance: "*Domus pacis.*" This palace, the best that the Venetian architecture of the Renaissance can boast of, like the glorious sea-front of the Gothic Ducal Palace, has its origin enveloped in mystery. This unnecessary uncertainty would seem to show that the world would rather subject itself to the imputation of forgetfulness than lavish too much praise on any individual. For this reason it prefers to attribute many works of art to the age which produced them. The conclusion, though it might appear unjust for narrow judges, would stand the test of philosophical principles. Even those who are best disposed to believe in a personal Homer must agree that what places his poems at the head of ancient poetry came from Homer's surroundings, and that the poet himself was the child of his age.

G. Boni.

TOWN-HALL, WARE, MASS. MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON, MASS.

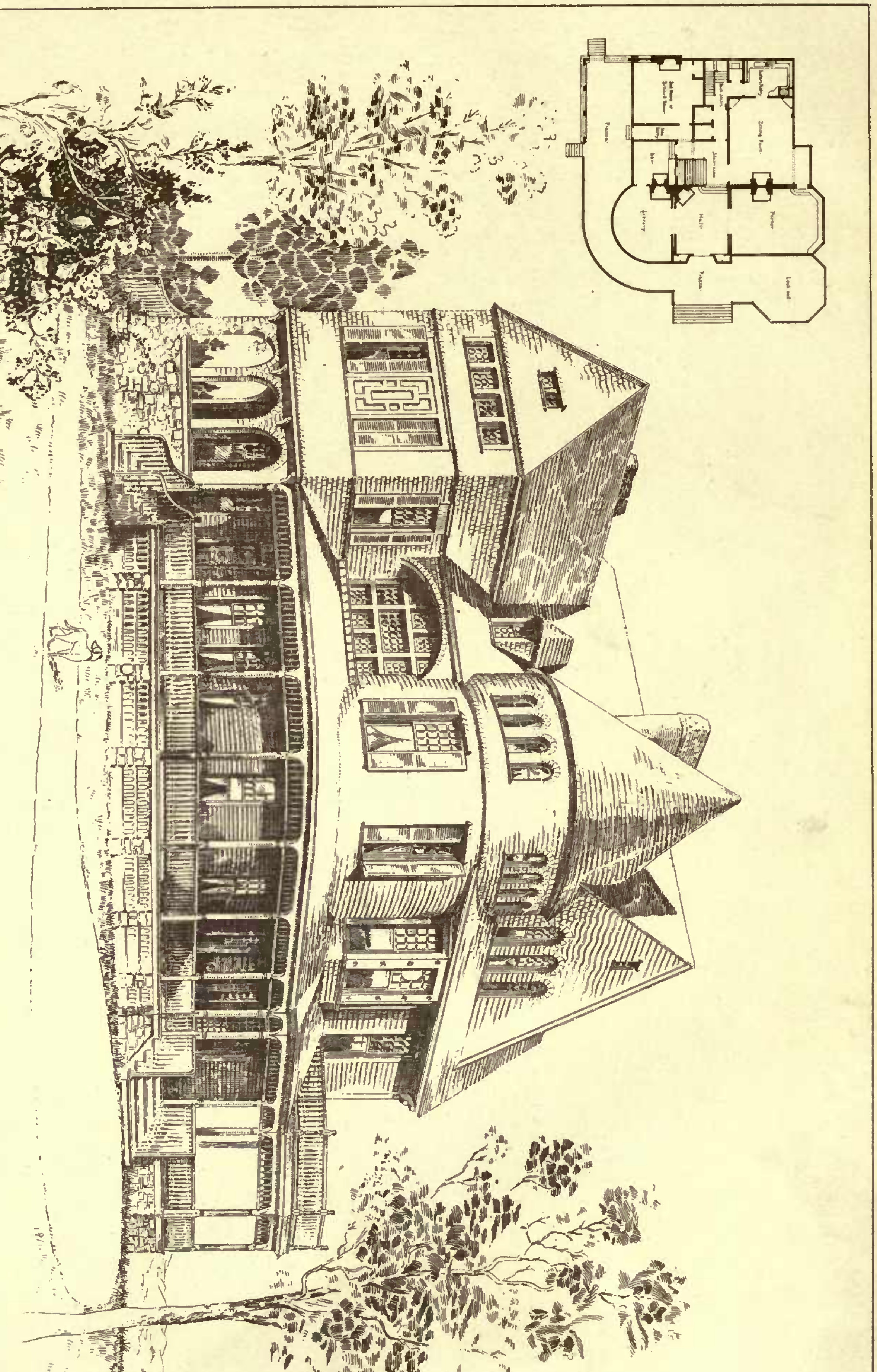
The building is to contain in its principal story, a hall seating 700, with gallery, ante-rooms and stage, with stage dressing-rooms in the half-story below. In the basement are rooms for town officers with vault, police department with cells, and a district court-room; the court-room and larger offices can be thrown together, and used as a

No. 499 American Architect and Building News, July 18 1885



Loredan Palace, Venice, Italy

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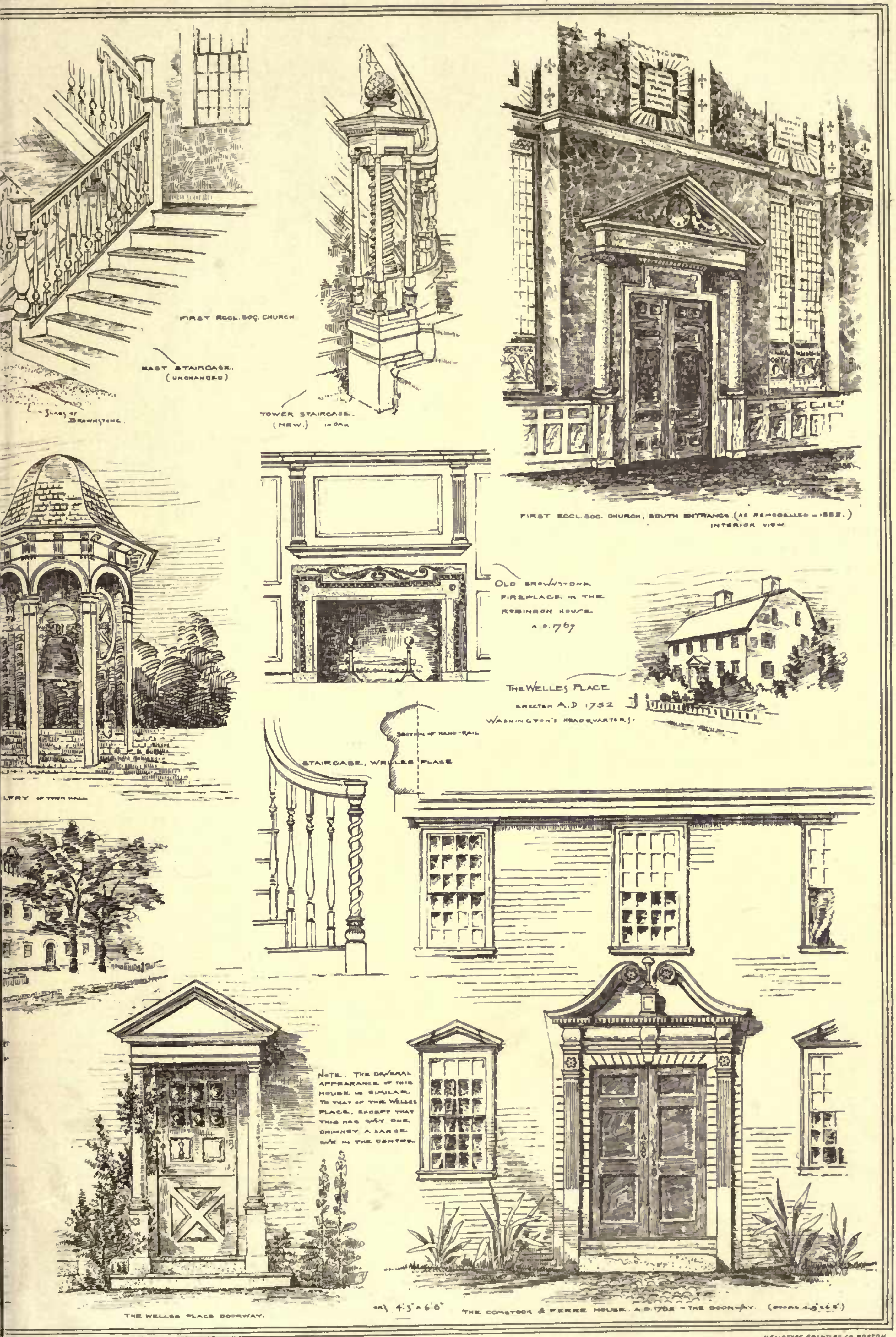
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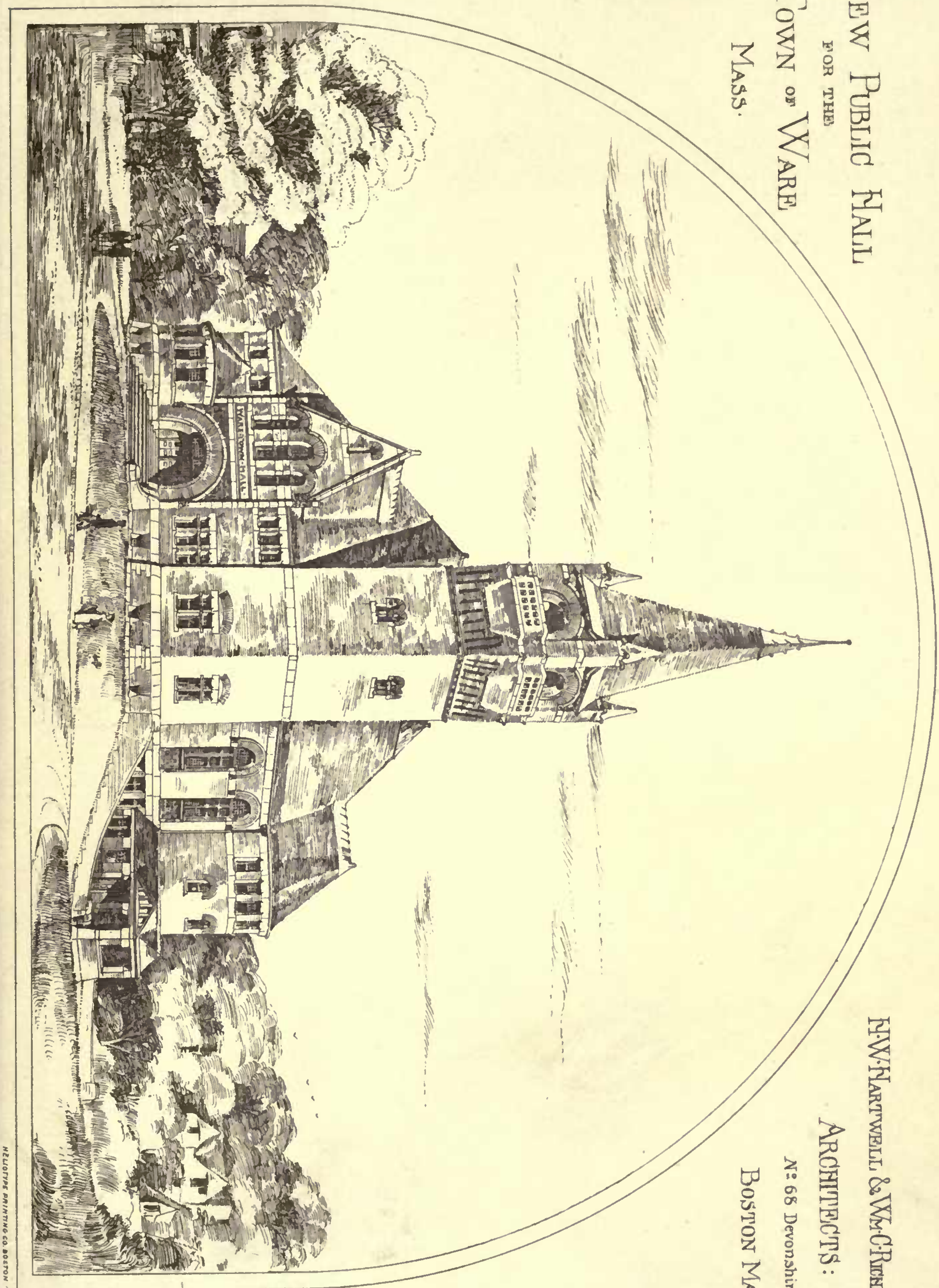

FIRST ECCL. SOCIETY'S CHURCH.
WEST SIDE OF SOUTH PORCH, (NEW)
THE OLD PULPIT
A.P.H. '85
SKETCH OF CORNICE
MISS SHEPHERD'S HOUSE. A.D. 1820
First Church Built A.D. 1645
Second Church Built 1685
This Church Built 1761
Alterations Made 1838
Remodeled. 1882
OAK TABLET OVER SOUTH ENTRANCE
Sketches about WETHERSFIELD CONN. by M.P. HAPGOOD.
THE TOWN HA
FIRST ECCLESIASTICAL SOCIETY'S CHURCH, (BEFORE ALTERATIONS) VIEW FROM S.W.
STAIRCASE - ROBINSON HOUSE. CHERRY BALUSTERS 3 TO EACH TREAD.
CEILING OF VERANDA.
CORNER STONE OF CHURCH
Rim Lock. 7" x 12½". 1¾" THICK.
MAY. Ye 6 1761
NEW CHANCEL ORGAN LOFT OVER
TOWER
NEW VESTIBULE AND PORCH
A.P.H. '85

R. OSGOOD & Co



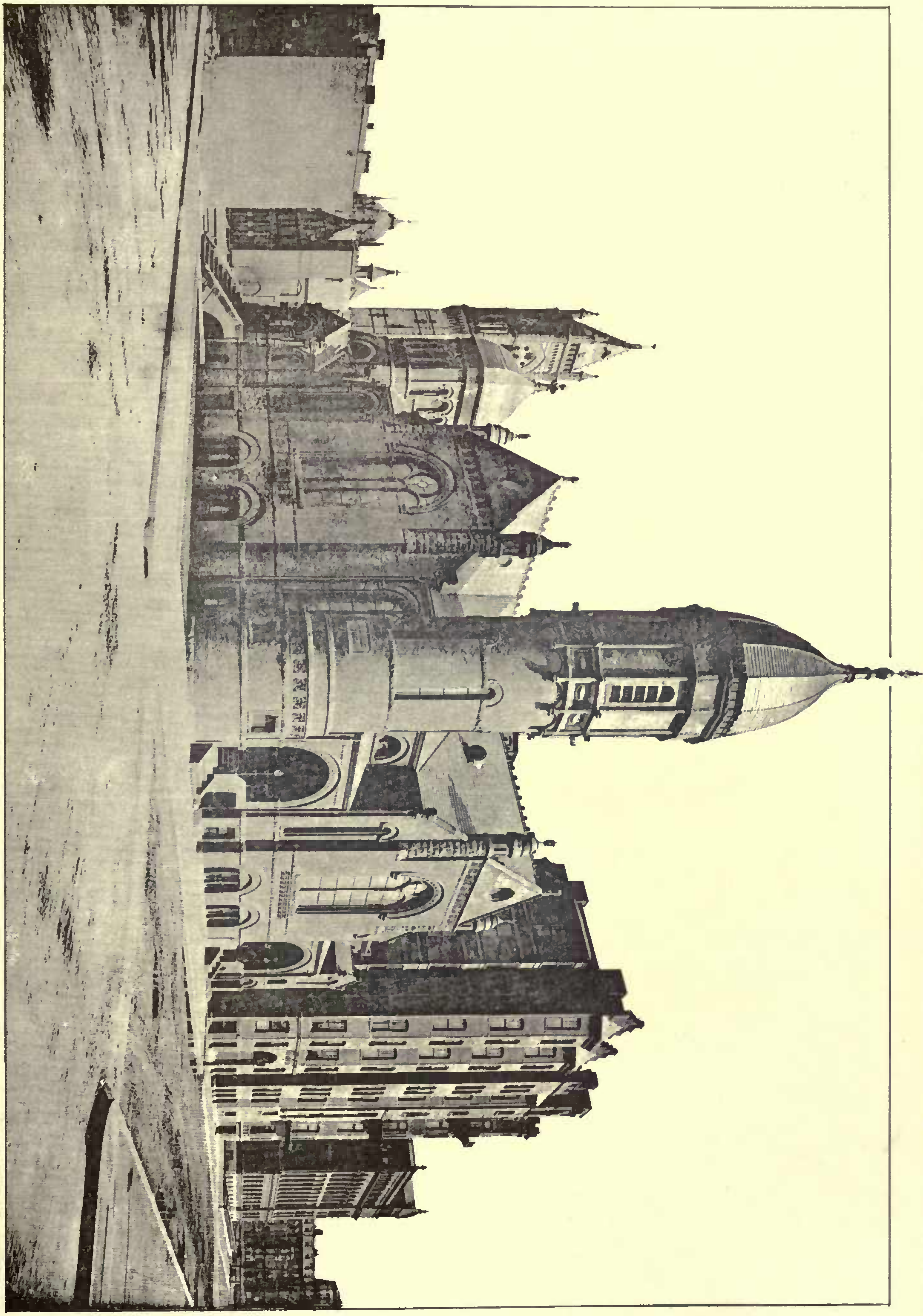
HELIOTYPE PRINTING CO BOSTON

New Public Hall for the Town of Ware Mass.



H. W. Hartwell & Wm. C. Richardson
Architects:
No. 68 Devonshire St.
Boston Mass.

HELIOTYPE PRINTING CO. BOSTON



New Hollis St Church, Boston, Mass.

George F Meacham, Arch't.

HELIOTYPE PRINTING CO BOSTON

supper-room. The walls of the building are to be of brick, with Longmeadow stone trimming. The main hall is to show an open timber roof.

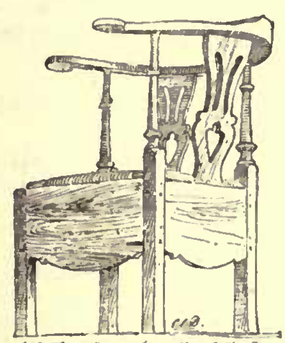
HOUSE FOR A. NEWBOLD MORRIS, ESQ., RIDGEFIELD, CONN. MR. CHARLES A. GIFFORD, ARCHITECT, NEWARK, N. J.

THIS house was built at a cost of about $17,000. The first floor is finished in hard-woods; hall and staircase in quartered oak, Elizabethan style; parlor in white and gold, Colonial style. The foundation is built of cobble and field stones laid in cement, the natural surface, moss, vegetation, etc., on the stones being disturbed as little as possible. It was required to keep the room used as bedroom on first story quiet, yet ready of access from indoors and out, hence the arrangement of passages in the plan. The plumbing is first-class, and is arranged in a vertical line for the different stories. The shingles are left unpainted in all cases, to color with age. The situation is on a ridge, about 1,000 feet above tide, commanding views in every direction.

THE NEW HOLLIS STREET CHURCH, BOSTON, MASS. MR. GEORGE F. MEACHAM, ARCHITECT, BOSTON, MASS.

As we published in our issue for March 7, last, a view of the venerable edifice, which had been abandoned by its owners for a new structure and a more fashionable quarter of the city, it seemed worth while to show what sort of a new lamp had been secured in place of the old.

SEWAGE FUEL AND THE PROCESS OF MAKING IT.



Old Furniture from the Collection of the late Mr. Emerson, G. Shaw. North Beverly Mass:

THE following paper by Carl H. von Klein, A. M., M. D., of Dayton, Ohio, will be found of interest as suggesting a means for the disposal of sewage: —

Ever since the fact has been recognized that zymotic, constitutional and even local diseases are produced by miasma or offensive effluvia of obnoxious gases arising from privy-vaults and other places where animal and vegetable matters are deposited and there undergo decomposition, it has become a study worthy the intellect of sanitary scientists to know wherein lies the remedy. What shall we do with our excrement and garbage, which contaminate the water we drink and the air we breathe? has been the inquiry of ages. In my mind there arose several years ago the question, "Could this decomposed and decomposing matter be metamorphosed so as not only to be harmless, but actually advantageous, to suffering humanity by being converted into fuel?" Here was required a zeal for scientific and chemical research. I feared, too, that my knowledge of chemical science was too limited to pursue those investigations with advantage. In fact, it appeared necessary to possess the knowledge of a manufacturing chemist, not of an artificer like myself. Thinking perhaps I would stumble on some excellent method by borrowing from writings and teachings of others more competent for the task, many years have elapsed and numberless experiments have been made without encouragement. Small is the number of works on chemistry I have not consulted.

For my object they appeared as a mere barren desert. No one to whose voice I wanted to listen could give me any information respecting it. All these obstacles were very discouraging, but I continued. I now have the honor to disclose the method by which it can be accomplished. The substance may be treated anywhere, in the vault or in an open field, in the following manner: For example, take a vault containing forty barrels of excrement; throw in one barrel of chloride of sodium (salt). Twenty-four hours after, throw in fifteen bushels of unslaked lime. This will form chlorinated lime; the fumes may be started with four ounces of nitric acid. Let it remain for eight days; then it will all be dissolved and the contents disinfected. Next add seventy-five pounds sal soda. This will solidify within ten days, unless there is a very great excess of liquid, in which case the proportion of lime may be increased, thus completely and entirely disinfecting and deodorizing the mass; and it may now be made into bricks, which will take about thirty days to dry in the open air and be ready for use as fuel. It is odorless and in every way cleaner than any other fuel known. It can be seen that all the ingredients used with the animal and vegetable matter have disinfectant qualities. It produces a better flame and retains more heat than Allegheny coal, the salt and soda both having flame-inducing qualities, and the lime the heat-retaining quality.

The question now arises as to the expense of producing this fuel. We will, therefore, estimate on forty barrels of excrement:

1 barrel of salt	$1.00
15 bushels of lime at 12 cents per bushel	1.80
75 pounds of soda at 1 cent per pound	.75
Labor (one day)	2.00
Total	$5.55

This will equal three tons of coal at the rate of $3.50 per ton, making total $10.50, almost within a fraction of one-half the cost of the cheapest fuel we have in the market. There is another point to which I desire to call attention, of great importance. The above mode of preparing the fuel is of that which is collected in vaults. If the sewers were provided with receiving-basins at the outfall, into which all garbage might also be placed, the whole mass could there be treated in the same manner. There is only the question of adoption of this important discovery, the outcome of sanitary science, that stares us in the face. I cannot see what excuse can be offered to let it remain idle and jeopardize human life, as the method is cheap, clean and good. — *The Metal Worker.*

PREVENTION OF DRY-ROT IN TIMBER.



Head of Lion. Mediæval Sculpture.

WE recently published an article showing the causes of dry-rot in timber, and amongst other processes of preservation we referred to a paper by Mr. Boulton on its antiseptic treatment. As the subject is an important one to wood-workers, we now give the following: "There can be but two opinions as to the growing importance of studying the question of timber preservation, having regard more particularly to the reckless manner in which our own forests have disappeared, and the little care that is bestowed on those of our colonies and the United States — forests as yet of vast area, but, nevertheless, thinning so rapidly as to be palpable to the most casual observer. It is true that the substitution of iron and steel for wood in the navies of the world has largely diminished the call for timber in that direction, but this diminution is made up for by the enormous extension of the railway system and the demand for sleepers and telegraph poles, as also for the piles necessary for the great harbor and reclamation works, that are so numerous at the present day." Any information concerning the practical preservation of wood is therefore of extreme value, and Mr. Boulton's pamphlet[1] (the result of a paper read last autumn before the Institution of Civil Engineers) is one which deserves careful study.

The appearance on a large scale of the dry-rot in the ships of the British Navy, at a time when they really were the wooden walls of old England, was naturally a subject of considerable alarm, when we know that a single seventy-gun ship required for its construction the oaks of forty acres of forest, and therefore it was not to be wondered at, that as early as the beginning of this century, various proposals were made to stem the evil by the use of various salts of metals. The inquiry assumed more definite proportions, however, when the railway era was fairly inaugurated, and it was found that stone sleepers were too rigid to be useful; and several materials were experimented upon for timber preservation with more or less success. The first system of treatment was called Kyanising, after its inventor, Mr. Kyan, and consisted of the use of corrosive sublimate. It answered the purpose very fairly, especially when the timber was in a dry situation, though it failed when tried under water, and particularly under sea water. Moreover, corrosive sublimate was found to be rather too volatile at ordinary temperatures, and too injurious to those who had to handle it. Margarising, the system adopted by Mr. Margary, was the employment of the sulphate of copper, which appears to be the most reliable of all the metallic salts, and is still in use in France. Burnettising (after Sir William Burnett) was the adoption of chloride of zinc, a good timber antiseptic, but very soluble in water. It is still in favor in Germany and Holland. Finally came Mr. Bethell's celebrated patent for creosoting — a bad name for the existing process by coal-tar, as in reality creosote is a product of the destructive distillation of wood, which has never been used for timber preservation; and the only excuse for the name was because somebody discovered carbolic acid or phenol in both coal-tar and wood distillation, so that it must be understood that creosote, in its popular application to wood-preserving, is not creosote, but oil of tar.

The basis of the action of all these remedies was supposed to be that they coagulated the albumen of the sap, and formed insoluble compounds that arrested decay; but as it has been proved by experience that the salts of metals are not so efficacious or so permanent as the tar-oils, the so-called creosoting process has now for a considerable period outlived it competitors. Even in France, where the sulphate of copper has held its own longer than anywhere else, partly because there was a difficulty of getting the creosote, partly because Dr. Boucherie injected the sulphate in a peculiarly ingenious manner, and partly because it was noted that the salts of metals became washed out in damp situations, even there the creosoting process has met with great approbation, since M. Forestire observed how thoroughly the timber was protected against that most troublesome pest, the teredo navalis. The oil used in creosoting is thus prepared. When coal is carbonized for gas-making, the products given off are four, viz.: illuminating gas, ammoniacal or gas-liquor, coal-tar, and coke — all of them, in their several ways, of extraordinary commercial value, though, in the present case, the coal-tar, a black treacly-looking substance, is all that we have to deal with. It may be mentioned, however, incidentally, that the waste or gas-liquor is the parent whence the ammonia group is manufactured on a large scale

[1] Boulton on "*The Antiseptic Treatment of Timber.*"

By distilling the coal-tar, three separate groups of products are obtained: first, the oils which are lighter than water, such as the naphthas, which are of incalculable importance to the country, as from them are ultimately procured the aniline dyes; secondly, the oils which are heavier than water; and, thirdly, the pitch, which is the residuum of the distillation. The lighter oils form a category of themselves, quite distinct from the heavier ones, and have never been used for creosoting purposes; but they are extremely rich in their own particular constituents, yielding, amongst other results, the benzoles from which the aniline is obtained, the toluols, the solvent and burning naphthas, and carbolic acid, whence is derived the picric acid used for fulminating purposes. The heavy or "dead" oils form the creosote of the timber-yard, and they were formerly treated *en masse*, though now each constituent can be separately removed according to its volatility. These dead oils are divided by the trade into two kinds: "London" and "country," the former being the distillation from the best Newcastle coals, which are usually supplied to the south of England, and are much richer than other coals in semi-solid substances, such as anthracite, naphthalene, etc. The country oils, on the other hand, are distilled from the midland coals, and are more volatile, besides containing a larger proportion of tar-acids. In the earlier days of Bethell's patent, the heavy or dead oils were alone used, it being considered that the crude naphthas were useless as antiseptics, and that the pitch, from its solidity, would form an impediment to the injection; but the fashion gradually came into use of mixing a small percentage of country with the London oils, as diluents of the more solid material, and, in point of fact, the country oils became popular and mentioned in specifications.

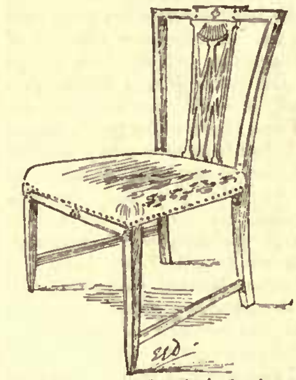
The inspectors liked them because they were thinner and injected with less trouble, and also because the timber thus treated looked cleaner and less muddy. The late Dr. Letheby, too, gave a great impetus to the growing use of the country oils, as he considered that the carbolic acid (which had been discovered in coal-tar by Runge, in 1834) was the key of the whole position, and that the efficacy of the treatment consisted in the percentage of carbolic acid. It was his object, therefore, to exclude the naphthalene and para-naphthalene as of no value, but to include the lighter portions of the oils, viz., those which distilled between 360° and 490° Fahrenheit, as containing the tar-acids in the greatest abundance. Here, again, incidentally, we may mention that this para-naphthalene, useless in timber preserving, has been found to ultimately yield anthracene, the parent of alizarine, that beautiful red dye that has so completely superseded madder in textile operations.

Dr. Letheby, however, did not have it all his own way, for the investigations of De Gemini and Rottier, in France, and of M. Coisne, in Belgium, seemed to entirely disprove his conclusions. The latter gentleman, an engineer in the service of the Belgian Government, placed shavings in a putrefying pit for four years, saturated with creosote containing respectively fifteen per cent, eight per cent and seven per cent of tar-acid, while one sample was of heavy specific gravity, and held no tar-acid whatever. This last experiment, however, was the most successful of all, and throughout the whole series it was evident that the results were in favor of the heavy oils, and that the tar-acids were of no use at all. The Belgian Government accepted M. Coisne's statement, and does not stipulate in its railway specifications for any tar-acids, though it allows thirty per cent of naphthalene, one of the very substances discarded by Dr. Letheby. Following an inverse method of examination, M. Coisne procured and analyzed some creosoted sleepers that had resisted decay for twenty years, and found no tar-acids, but on the contrary, plenty of naphthalene. Similar experiments were undertaken by Mr. Boulton, in 1882, on sleepers from various railways which had been in use from sixteen to thirty-two years, and his analysis, says the *Builder*, proved four things: 1. That no tar-acids were detected by the ordinary methods. 2. In the majority of cases the semi-solid constituents, such as naphthalene, were present. 3. Only small percentages remained of oils distilling below 450° Fahrenheit; all these facts proving that it was through the action of the heaviest and most solid portions of the oils that the preservation was effected. 4. He detected an alkaloid called acridine, which he thought played an important part in the action, it being undoubtedly a powerful germicide and solidifying within the pores of the timber, without evaporating or being washed out. Mr. Greville Williams also came to the conclusion that the antiseptic results of creosote were due more to the basis of alkaloids than to the tar-acids, the former remaining while the latter seem to disappear. It is therefore most probable that it is this unfortunate quality of evaporation that disqualifies the tar-acids, seeing that, taken *per se*, there is no doubt but the acids are powerful antiseptics, and that the presence arrests decay. Mr. Boulton's experiments show that if tar-acids and napthalene be separately exposed at the same temperatures, the former will evaporate much more quickly than the latter; indeed, by repeated washings with cold water, both carbolic acid and cresylic acid (its near relation and a constituent of tar-oil) can be completely disposed of, a most important fact in connection with the exposure of timber to sea-water.

Viewing all these facts in their bearings upon specifications, it would seem as if the London oils, as they come from the still, are not sufficiently volatile, nor do they comply with the requirements as regards the percentage of tar acids. A pressure is, therefore, put upon the manufacturer to meet the case by taking out some of the heavier portions, by which the bulk is rendered lighter and the proportion of the tar acids to the diminished bulk is increased. But Mr. Boulton considers that this is a mistake, and would rather relegate the lighter portions of the tar acids, and especially carbolic acid, to their proper position as sanitary antiseptics for which they are unrivalled, and would encourage the use of the heavier portions. He also agrees with the joint creosoting specification of Sir Frederick Abel and Dr. Tidy, who resolved to exclude no semi-solid bodies which completely melt at 100° Fahrenheit, and further changed the standard of volatility from ninety per cent at 600° Fahrenheit to seventy-five per cent.

Without going into the vexed regions as to the exact relations of putrefaction and the germ theory, the conclusions drawn are, that the best antiseptics for timber are to be found amongst oils and bitumens, which fill up the pores of the wood. Of such bodies, those that contain germicides are to be preferred, and other properties being equal, those which either solidify in the pores of the wood, or which require an extremely high temperature to volatilize them, and which are insoluable in water, are the best of all. With regard to the creosoting process, Mr. Boulton lays great stress on the hygrometic condition of the timber at the time of injection, neglect of which has often been the cause of failure. The power of absorbtion of moisture in woody fibres is so great — fir timber being able to take up as much as from sixty gallons to one hundred and fifty gallons of water to the load of fifty cubic feet — that it has always proved of great difficulty in the way of treatment, as the subjecting of the timber to a dry heat invariably results in injury to it. Mr. Boulton has however, successfully met the difficulty by a most ingenious combination of air-pump action with the use of creosote heated up to 212° Fahrenheit. With charges of very wet sleepers, he has withdrawn water equal in volume to fifty gallons per load of timber, the water being replaced with an equal volume of creosote by the action of the air-pump alone. — *Woods and Forests.*

THE "CRINOLINE" CHIMNEYS OF THE CAMBRIA IRON COMPANY.


Old Chair at Soldier's Carnival, Boston, Mass. April 1885.

AT the suggestion of Mr. John Bogart, secretary of the American Society of Civil Engineers, a number of members of the Society presented papers on the design and construction of chimneys containing features worthy of note. Among them was one by Mr. George Webb, of the Cambria Iron Company, on the "crinoline" chimneys at Johnstown, which we quote:

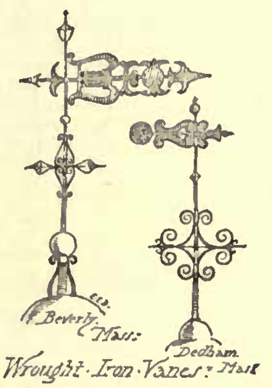
These chimneys are connected to the boiler-house by underground brick conduits, and are intended as "uptakes" for the unused gases. The surplus gases are used for generating steam, and but little is left after passing under the boilers. Sometimes the fires under the boilers must be reinforced with raw coal, in which case the chimneys convey some smoke. The ground is had, and hence there is a deep foundation of masonry below the surface. From the entrance of the conduit to about eight feet above the surface the base of the chimney is hexagonal, of hammered stone, surmounted by a cut-stone coping. Six three-inch anchor bolts are built into this base, and provided with suitable nuts to hold down a base-plate four inches thick, and with an upward projecting rim six inches high around a circle twelve feet in diameter. From this base-plate it is one hundred and forty feet to the top of the chimney. At the top is a moulded cast-iron plate similar to the base-plate, with the rim projecting downward, ten feet two inches in diameter. The batter is therefore twenty-two inches in one hundred and forty feet. Between these two plates the "crinoline" is constructed. It consists of sixteen vertical lines of ordinary wrought-iron railroad rails, four-inch base, with the base outward, surrounded by forty-five hoops. The rails may be in sections of any length which will allow of the splice being riveted to a hoop, care being taken to avoid having more than one rail-splice on the same hoop. Well-selected old iron rails with good bases, or sound sections of No. 2 or No. 3 rails, are as good as any.

The hoops are of wrought-iron rolled from iron three-fourths inch thick. Each hoop is in two pieces, bent cold to a true segment in a wedge-adjusting bending machine, which allows any desired delicacy of touch. The piece lies on edge while being bent, the "former" being more readily tried in that way. If bent hot the curve cannot be maintained while cooling. The two halves of each hoop are spliced on the inside with flat plates, secured with four rivets and one bolt in each end of each section, care being taken that at least three hoops shall intervene solid before another hoop-splice is made between the same verticals. There are forty-five hoops, the bottom one being near the base-plate projection, and therefore about twelve feet in diameter. The distance in the clear from this hoop to the next one above is twenty-two inches. The clear distance between each pair of hoops gradually increases from the bottom to the top, the distance in the clear between the top hoop and the next below being fifty-four inches. Each hoop is riveted to each rail with two rivets — one in the upper flat space of the hoop, and the other on the other flange of the rail in the lower flat space of the hoop.

The iron skeleton thus made is so stable that no scaffolding is used in construction. Two boards across a lower ring will hold a portable forge. A rail section is hauled up, put in place, adjusted and riveted; then others in the same way. The central opening of the chimney is eight feet, which is preserved throughout. The bricks fill from this central opening to the inner side of the hoops, special bricks being moulded to fit around the rail heads, and thus save time and waste of cutting. To save cutting bricks the masons carried the inside parallel with the outer batter, and when the inside got to eight feet in the clear they set back on the inside to an even brick, and then followed the outer batter until the inner diameter reached eight feet again, and so on. There are about one thousand bricks, average, to one foot in height of stack. Five bricklayers and nine laborers lined the first chimney built in twenty-one days, the next in eighteen and one-half days. They used no scaffolding but two scantlings and a few boards on the inside at convenient intervals, thus leaving a well-hole open the entire height. These were removed from the top downward after completion. A light iron ladder is riveted to, say, every third hoop the entire height. The convenience of this for construction, examination and repairs, if needed, is obvious.

The strength of this chimney is in the "crinoline." The bricks are merely for inclosure of the gases. Their mass is so small and the walls are so thin that they are never hot. The "crinoline" of the first chimney was built the entire height before the brickwork was begun. Some heavy storms occurred while it stood thus, and it never wavered.

SHALL WATER-PIPES AND GAS-PIPES BE CONNECTED WITH LIGHTNING-RODS?



EVERY man who builds a house become interested in the subject of lightning-rods, even if the subject of electricity had failed hitherto to attract him. In placing lightning-rods upon a building, the question immediately arises, "Shall the water-pipes and the gas-pipes be connected with the exterior lightning-rod?"

Theoretically, there is no doubt that this connection should be made. Great care, however, should be taken that the connections should be large enough not to be melted by a discharge of lightning, and that there should not be any break of metallic continuity caused by paint, varnish, or cement. In the fifth annual report of the Water Commissioners of the city of Fitchburg, Mass., this paragraph occurs:

"During a violent thunder storm on the sixth day of June, two houses were struck by lightning, one on Burnap Street and one on Milk Street. The electric fluid in both cases followed the service-pipes from the buildings to the four and six inch wrought-iron cement-lined main pipes, and when it reached these mains its path of ruin was fearful. In some cases a length of pipe would be split from end to end, others would be perforated with holes, which in almost every case indicate that the fluid passed from the outside to the inside of the pipe. Nearly every joint on the two thousand feet of its course was opened, and one gate and two hydrants were so badly damaged as to be useless. The pipe was replaced by cast-iron pipe, and the gate and hydrants by new gate and hydrants, the total cost of which was nearly $1,700. This loss is added to the maintenance account of the current year. Three times our main pipes have been struck by lightning, and each time is more alarmingly suggestive of what accidents may happen from the same cause. Cannot some electrician give us a plan of protection?"

On investigation it was found that the cement-lined pipe was made as follows: The wrought-iron shells were eight feet long, made of about eighteen-gauge iron, lined on the inside with cement one-half inch thick, and covered on the outside with cement from one-half inch to one inch in thickness. In laying, the ends were butted together, over which is a sleeve filled with cement, about six inches in length, to make a water-tight joint. In laying, the iron of one length does not usually come in contact with the iron of the next length, being separated by from one-eighth inch to one-fourth inch of cement.

In taking up the damaged pipe it was generally found burst from end to end; then for three or four lengths no trace of lightning could be discovered on the outside of the cement covering; but at each joint one to ten holes could be found punched from the outside of the pipe into it, from one-tenth of an inch to three-fourths of an inch in diameter; then a sleeve would be cut as smooth as could be done with a pair of snips; then a length burst; and then the lightning disappeared at a hydrant or gate.

The water-mains of Fitchburg have been damaged seriously by lightning five times. In every case buildings have been struck, and the discharge has followed the supply-pipes to the main; there it has divided and followed the main each way until it has reached a valve. In 1877 about 2,000 feet of mains were destroyed in one shower. In every case the damage has been confined to the old cement-lined pipes.

It will be seen that the cement-lined pipe when filled with water constitutes a Leyden jar, which is quickly ruptured by being heavily charged. It is manifestly unsafe to cover the iron-mains with any insulating varnish unless metallic connection is made with each section of the main at the joints, and these joints are connected to the water by a unvarnished piece of iron or other metal. If cement-lined water-pipes are connected with the lightning-rods, it is necessary to remove the cement at regular intervals to allow contact between the water and the iron of the pipes. It would be sufficient to insert pieces of iron here and there in the cement, one end of such pieces being soldered to the iron of the pipe and the other end being in free contact with the water.

If the gas-pipes are not insulated from each other at the joints, there can be no danger in connecting the lightning-rods with them. The electrical continuity, however, of the gas-pipes should be carefully ascertained. The practice of connecting telephone-wires with gas-pipes shows that in most cases this electrical continuity is insured by the present method of laying the pipes. — *Scientific American.*

THE NEW YORK HIGH-BUILDING LAW.

AN Act to regulate the height of dwelling-houses in the city of New York. Passed June 9, 1885; three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows: —

SECTION 1. The height of all dwelling-houses and of all houses used or intended to be used as dwellings for more than one family, and hereafter to be erected in the city of New York, shall be regulated in proportion to the width of the streets and avenues upon which they front.

SECT. 2. Such height, measured from the sidewalk line, and taken in all cases through the centre of the façade of the house to be erected, including attics, cornices and mansards, shall not exceed seventy feet upon all streets and avenues not exceeding sixty feet in width, and eighty feet upon all streets and avenues exceeding sixty feet in width. Nothing in this act shall be construed as affecting buildings for which contracts have been signed prior to the passage of this act, or for which plans have been filed and approved by the Building Department.

SECT. 3. This act shall take effect immediately.

STATE OF NEW YORK, Office of the Secretary of State, } *ss:*

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

JOSEPH B. CARR, Secretary of State.

NOTES AND CLIPPINGS.

VALUE OF THE ART TREASURES OF PARIS. — An inventory has been made of all the objects of art belonging to the city of Paris. The total valuation amounts to 12,256,800 francs, of which 8,078,551 francs belongs to the sixty-eight churches of Paris, and 4,178,000 to the secular buildings. The sculptures at the Hôtel de Ville are valued at 1,384,000 francs, the tapestries at 2,250,067 francs. — *Exchange.*

TOUGHENING TIMBER. — This is a new process by which it is claimed that whitewood can be made so tough as to require a cold-chisel to split it. This result is reached by steaming the timber and submitting it to end pressure, technically "upsetting" it, thus compressing the cells and fibres into one compact mass. It is the opinion of those who have experimented with the process that wood can be compressed 75 per cent, and that some timber which is now considered unfit for use in such work as carriage building could be made valuable by this means; and more especially since the rapid consumption of our best ash and hickory will sooner or later render some substitute necessary.

APPROACHING EARTHQUAKES. — The earthquake shocks which were felt last week over a wide area in Yorkshire remind us that an authority on the subject of these phenomena, M. Delaunay, of Paris, is of opinion that next year will see the recurrence of upheavals of the earth's crust in an intensified form. M. Delaunay is a prophet of evil, but unfortunately all his prophecies have hitherto come true. His specialty is earthquakes, and he predicts them only too surely. In 1877 he announced that the year would not conclude without violent disturbances of the earth, and as a matter of fact, two frightful catastrophes on the coasts of South America followed. In 1883 M. Delaunay again pointed to approaching earthquakes, and soon after the volcanic eruptions in the Indian Archipelago occurred, by which thousands of human beings lost their lives, and hundreds of square miles of terra-firma were engulfed by the sea. Toward the end of last year M. Delaunay once more raised his warning voice, and the earthquakes in Spain proved how well founded were his warnings. Quite recently he has prophesied very severe volcanic disturbances for 1886. Having acquired a well-merited notoriety in foretelling earthquakes, some weight ought to be attached to M. Delaunay's utterances. He affirms that next year these natural phenomena will be of a very intense character, and that they will show themselves either when the earth is under the direct influence of a planet of the first rank, such as Jupiter, or under that of a group of asteroids, or at a time when sun and moon are nearest to our planet at the same time. —*Iron.*

PROPOSED DRAINAGE REGULATIONS. — The following excellent regulations have been proposed for the city of Glasgow, Scotland: 1. The positions and sizes of all drains, pipes, cesspools, or traps, and all soil and rain-water pipes and conductors shall be shown distinctly upon the plans submitted, and the weights per foot of the lead or iron soil-pipes, conductors and cesspools be marked on the plans in figures. 2. Forty-eight hours' notice must be given to the Master of Works, at his office, previous to commencing the laying of any drains. The party giving the notice will receive a card of permission to open the street, which card will be held as proof of the notice having been given. 3. All connection between drains and the public sewer will be made by workmen

of the statute labor department, and shall be paid for by the proprietor. 4. Every drain-pipe must have a uniform fall of not less than one inch to every lineal yard, and every pipe must be thoroughly packed and resting entirely on the solid earth. When the Master of Works deems it advisable, he shall require concrete foundations to be put under and around the drain pipes. 5. The joints must be well cemented and all cement projecting on the inside must be removed. 6. Sufficient traps and ventilation must be provided for, and fixed to the satisfaction of the Master of Works. 7. Before covering, all pipes must be inspected by the Master or his representative, and no junction connecting drain-pipes and plumber-work to be covered up until examined and passed by him. 8. The Master of Works to have power to use the smoke-test on all drains and plumber-work before the building is occupied, and at any other time he may consider necessary, all expenses connected with the test to be paid by the owner of the property. 9. No dwelling shall be occupied until the Master of Works has given a certificate that the drains and cesspools with traps, have been properly constructed, and the house otherwise fit for occupation. 10. Proprietors and contractors will give every assistance to the master of works, for the purpose of performing the necessary inspection.

The Paris Abattoirs. — The abattoirs at La Villette, which have replaced the analogous establishments scattered throughout Paris, cover an irregular surface of nearly fifty acres, and the buildings cover about 58,000 square metres. The general aspect is rather imposing. The façade towards the Rue de Flandres shows a grille about 20 metres interrupted by pilasters intended for allegorical groups. From the principal front six large avenues radiate, intercepted by smaller cross ones. All the buildings have Cronij stone dressings with filling of rough-dressed masonry or of brickwork. The partition-walls are in hard brick covered with Portland cement. The floors are of iron, covered with plastes and bitumen, the roofs entirely of tiles. To give some idea of the importance of the abattoirs and of the service they render, we may add that the work of the establishment occupies 150 slaughter-houses contained in eight groups of buildings; that the dwellings for butchers and shepherds, etc., occupy ten blocks of buildings, and that the stalls can allow space for 2,000 oxen, 7,000 sheep, 2,700 pigs, and 2,000 calves. Each year there is some new improvement in the general arrangement. Now it is a special railway to be made around the line of enclosure, communicating with all the other railways radiating from Paris to the provinces; now another suspension railway is constructed for the quicker circulation of the meat, etc. Farther on, three large pavilions are occupied in roasting pigs by gas; not to speak of other structures for the cleansing of offal, the triperies, the blood store, the extraction of albumen and animal oil, the preparation of calves' heads and sheep's feet, etc. For the purpose of having everywhere the indispensable element of cleansing, water from the Marne and from the Ourcy is received into sixty iron reservoirs which project into the establishment at all points. This is not all, for when the buildings are completely finished they will cover a space of 87,000 metres, and contain 311 slaughter-houses, of which 179 only are at present in work. The works have cost up to this moment about 16 millions (francs); about 7 millions more will be required to complete them. The cattle market, which forms the complement to the abattoirs, and opens on the Rue d'Allemagne, was commenced in 1867, and has cost about 19 millions. — *The Builder.*

A Reminder of Butler's Rule at New Orleans. — Most Northern visitors to New Orleans are agreeably surprised and a good deal puzzled at reading the highly patriotic and Republican sentiments carved on the bases of the statues which New Orleans has erected to the memory of General Jackson and Henry Clay. Beneath General Jackson's mounted figure is cut in strong, deep letters his famous anti-Calhoun toast, "The Union: it must and shall be preserved." Below Henry Clay's impressive form is carved, with equal distinctness, this sentence, taken from the public declarations of the great Whig leader: "If I could be instrumental in eradicating the deep stain of slavery from the character of our common country, I would not exchange the proud satisfaction which I should enjoy for the honor of all the triumphs ever decreed to any successful conqueror."

The surprise of the Northern visitor on reading this noble tribute to freedom and the Union on the streets of New Orleans gives place to a feeling of satisfaction, not unmixed with amusement, when it is recalled to his mind that these inscriptions, so alien to the sentiments of the people of Louisiana at the time the statues were erected, and which are almost in as little accord with the feelings of the dominant race of to-day, are a relic of General Butler's rule in New Orleans. That doughty patriot found these statues unadorned by any text from the writings or speeches of the distinguished men whose memory they were intended to commemorate. He straightway supplied the omission by having carved on them the sentiments given above, and they have ever since served to point a moral to the people of New Orleans, who, little as they doubtless relish them, have not seen fit to dig them out of the solid granite where Butler made them a premanent public record. — *Philadelphia Press.*

The Lightning-Rod on the Washington Monument.—A remarkable assertion is made in regard to the lightning-rod of the Washington Monument. It is said that electrical tests with a galvanometer discover a resistance of two ohms. This indicates clearly a very imperfect ground connection, and shows that the present [former] apparatus cannot perform the work expected of it. The inability to discharge a heavy stroke of lightning into the ground instantly is obvious under the circumstances, and offers an explanation of why a stone near the rod was instantly shattered. The only wonder is that more damage has not been done. The aluminum tip is reported to be all blackened and battered with lightning already. The placing of a lump of metal on top of a slender rod is said to be a mistake and another element of danger. It takes such a charge of electricity that the rod connection below is not sufficient to carry all away, and there must consequently be more or less discharge in other directions. In reference to the imperfect ground connection, which is the most important point of all, it is supposed that the concrete foundation into which the lightning-rod is sunk explains the resistance shown by the galvanometer. Although it is understood that the rod goes through the foundation and buries itself in the wet earth below, more perfect arrangements could, it is believed, be made. The scientists lately called upon to make a report on this subject have, it is understood, recommended additional tips on metallic prongs about the top of the monument, and these contrivances have been ordered. Electricians say that this will only increase the danger, All these criticisms may be but theories, but they come from a source entitled to the utmost consideration.—*Boston Transcript.*

Relative Costs of Fluid and Solid Fuels. — At the last meeting of the Engineers' Club of Philadelphia, the secretary presented, for Mr. James Beatty, Jr., a paper upon the Relative Costs of Fluid and Solid Fuels. After giving the relative advantages in economy of labor in use, reduction of weight and bulk, ease of manipulation of fire, perfection of combustion and cleanliness, the principal substances, experiments and processes are noted.

Notes and tables are given as to the compositions of different fuels, their heat units and evaporative capacities, efficiencies in furnace, prices per unit, and lbs. of fuel for $1.00 and lbs. of water evaporated from 212° F. for $1.00, in various localities. The paper concludes with the following table of which the author says: "These figures are very much against the fluid fuels, but there may be circumstances in which the benefits to be derived from their use will exceed the additional cost. It is difficult to make a comparison without considering particular cases, but for intermittent heating, petroleum would probably be more economical, though for a steady fire, coal holds its own."

	Anthracite.	Bituminous.	Petroleum.	Coal Gas.	Generator Gas.	Water Gas.
New York....................	1.00	1.08	1.71	14.92	22.90	8.70
Chicago......................	1.00	.71	1.50	8.72	18.30	7.00
New Orleans..................	1.00	.59	1.56	17.90	15.30	5.80
San Francisco	1.00	.64	1.50	8.75	9.40	3.50
London......................	1.00	.61	2.05	7.16	17.70	6.30
Port Natal....................	1.00	.90	1.2t			
Sydney	1.00	.34	1.39			
Valparaiso....................	1.00	.44	1.03			

Danger from Superheated Steam. — The Philadelphia Underwriters Tariff Association recently employed Professor Gibson to prosecute some experiments with steam-pipe coverings claimed to be fireproof. The result of the experiments is published in a circular, part of which we reproduce below: —

Experiments with Steam-pipe Coverings.

Name and Kind of Covering.	Range of Temperature Degrees, F.	Results.
Chalmer Spence Co., Sec. hair felt.	300 to 620	Began to char at 350° F., as was shown by the smoke issuing from it, and continued so until end of experiment. On subsequent examination, the first layer of felt was found completely charred through. No indication of flaming during the test.
Kelley Scroll Sec. Co., Sec. hair felt.	300 to 620	Results precisely same as above.
Shields & Brown, Pat. insulated air cov.	300 to 620	Began to char at 350° F., and continued to do so until at the close of the test. This broke out into a flame, the covering having been almost entirely consumed.
Kelly Covering Co., Cotton-seed fibre.	300 to 620	Began to show signs of charring at 400° F. On being removed and examined, the lining and layer of cotton-seed fibre was found charred about one-half through.
L. F. Aldrich & Co., Pat. metallic covering.	300 to 720	Showed signs of charring only when the temperature attained 600° F. On examination, was found charred nearly one-half through.
The Ainsworth Co., Wood pulp paste.	300 to 720	No marked signs of burning, but on examination was found to be somewhat charred on the inner surface.
Kelley Scroll Sec. Co,, Black wool.	300 to 720	Smoked slightly from the first; was found to be completely charred about one-half through the layer of wool.
Kelley Covering Co., Champion felt.	300 to 780	Began to smoke at 350° F., and continued to the end of trial; was found charred one-half through.
Kelley Covering Co., Corrugated paper.	300 to 780	Began to char at about 350° F. The inner layers next to the pipe were completely destroyed; outer left intact.
Shell of green pine wood closely fitted to the pipe.	250 to 680	Began to smoke at 250° F., charring one-eighth to three-sixteenths inch deep in one and one-half hours' time. On examination, the wood was found completely destroyed, perfect charcoal resulting.
Shell of dry pine wood closely fitted to the pipe.	250 to 680	Began to smoke at 290° F. At the close of experiment, the charred part did not differ materially in depth from the piece given above. On the edges, the charcoal seemed to have been formed a little deeper than the middle. This was the case especially where the pieces joined together. At the temperature attained, there was no indication of blazing, but this is believed to be only a question of time.
Wheat chaff in asbestos shell.	250 to 680	Began to smoke at 250° F. From the beginning to the end of the experiment, this smoked heavily, and on examination, over three-fourths of the chaff was found completely reduced to ashes, although no blazing took place during the trial.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

320,697. WOOD FLOORING. — Chas. E. Rider, Rochester, N. Y.
320,698. WOOD FLOORING-TILE. — Charles E. Rider, Rochester, N. Y.
320,708. FAUCET. — Peter Schofield, Pomona, N. J.
320,709. AUTOMATIC SEAL-TRAP FOR WASH-BASINS AND WATER-CLOSETS. — Wm. D. Schuyler, New York, N. Y.
320,718. CARPENTER'S SQUARE. — William Steers, Brattleborough, Vt.
320,736. TOOL FOR REMOVING CHIPS FROM MORTISES. — Godfrey Winzenreid, Schulenburg, Tex.
320,757. SHEATHING FOR BUILDINGS. — Denison S. Chesebro, Geddes, N. Y.
320,768. APPARATUS FOR COMBINING HOT-AIR AND STEAM FOR HEATING PURPOSES AND POWER. — Wm. T. Fenton, New York and David S. B. Bennet, Brooklyn, N. Y.
320,786. INSIDE SHUTTER. — Walter A. Holbrook, Milwaukee, Wis.
320,789. SPRING-HINGE. — Daniel W. Housley, Chicago, Ill.
320,790. DOOR-LATCH OR CHECK. — Matthew P. Ismay, Newcastle-upon-Tyne, England.
320,794. CHIMNEY CAP AND VENTILATOR. — Wm. J. Kayser and Charles Kayser, Milwaukee, Wis.
320,796. FASTENING FOR MEETING-RAILS OF SASHES. — Hiram T. King, Rochester, N. Y.
320,797. WRENCH. — Hiram T. King, Rochester, N. Y.
320,808. WINDOW. — Martin S. Millard, Kansas City, and George H. King, Salisbury, Mo.
320,813. RADIATOR-VALVE. — W. Baird Patton, Duluth, Minn.
320,815. CHIMNEY-COWL. — George W. Powers, Jas. H. Jones, James M. Powers, Streator, Ill.
320,822. TILE. — Paul Simons, Darmstadt, Hesse, Germany.
320,845. GUIDE FOR SAWING STAIR-RAILS. — Strong Burnell, Anacortes, Wash.
320,854. FIRE-ESCAPE AND ELEVATOR. — Chas. R. S. Curtis, Quincy, Ill.
320,865. BRICK AND TILE MACHINE. — Frederick E. Frey, Bucyrus, O.
320,866. BEVEL. — Charles Friess and John N. Todd, Minneapolis, Minn.
320,868. BIT-BRACE. — Hiram E. Fuller, New York, N. Y.
320,871. BURGLAR-ALARM. — William Goldspohn, Lodi, Wis.
320,872. PIPE-WRENCH. — James F. Guthrie, Jr., Cambridge, Mass.
320,887. MIXING WHITE LEAD WITH OIL. — Wm. H. Pulsifer, St. Louis Mo.

SUMMARY OF THE WEEK.

Baltimore.

STORE. — Chas. L. Carson, architect, is preparing plans for A. S. Alder, Esq., for a four-st'y brick, stone and terra-cotta building, 22' x 90', to be erected cor. Eutaw and Clay Sts., and to cost $20,000.

VILLA. — Mrs. M. A. Mentz is to have built a stone villa on Charles Street, extended, on lot 66' x 200', to cost $10,000, from designs by W. Claude Frederic, architect; Geo. A. Foreman, builder.

DWELLINGS. — W. Claude Frederic, architect, has prepared plans for Wm. T. Phillips, Esq., for 4 three-st'y brick and terra-cotta buildings, with basement, on lot 66' x 150', w s McCulloh St., near Laurens St., to cost $20,000; Geo. Moke, Jr., builder.

W. R. Llewellyn, Esq., is having built, on lot cor. Mary St. and Fulton Ave., 17 two-st'y tenements, of a novel design, from drawings by W. Claude Frederic, architect.

ADDITION. — W. F. Weber, architect, is preparing plans for a six-st'y brick, stone and terra-cotta addition to the "Hoen Building," 25' x 80', to be erected on North Street, and to cost $15,000.

BUILDING PERMITS. — Since our last report fifteen permits have been granted, the more important of which are the following: —

Henry Williams, four-st'y brick warehouse, e s Charles St., between Camden and Conway Sts.

J. D. Taylor, 6 two-st'y brick buildings, e s Fremont St., s of Presstman St.

E. W. Haviland, 2 three-st'y brick buildings, n s Vine St., between Pine and Arch Sts.

Chas. Milke, 6 two-st'y brick buildings, e s Chester St., s of Jefferson St.

Mrs. A. Greenwald, 2 two-st'y brick buildings, commencing n e cor. Fairmount Ave. and Duncan Alley.

Richard Henschel, three-st'y brick building, n s Saratoga St., w of Gay St.

Geo. G. Pedrick, 7 three-st'y brick buildings, w s John St., commencing n w cor. Mosher St.; and 4 three-st'y brick buildings, n s Mosher St., between John St. and Foster Alley.

Boston.

BUILDING PERMITS. — *Brick.* — *Tremont St., Nos.* 383 *and* 385, store, 47' x 60'; owners, Sullivan & McDonald; builders, Sullivan & Tobin.

Newbury St., Nos. 314 *and* 316, 2 dwells., 18' x 48' and 25' x 46'; owner and builder, Edwin H. Horn.

Saratoga St., near Byron St., engine-house, 36' 8" x 78' 4"; owner, City of Boston.

Pearl St., Nos. 117-123, mercantile, 40' 6" and 43' x 73' 5"; owner, J. H. Lee; builder, G. W. Pope.

Wood. — *Sagamore St.*, near Savin Hill Ave., dwell., 24' x 30'; owner, Chas. Kelley; builder, P. F. Hanlon.

Magazine St., Nos. 29 *and* 31, dwell., 20' x 45'; owners, John Dimmick; builder, Madden & O'Brien.

Faneuil St., near Parsons St., dwell., 20' x 28'; owner, Patrick Kenney; builder, D. M. O'Connell.

Everett St., near Lincoln St., dwell., 22' x 28'; owner and builder, G. W. Mixer.

Skinner St., near South St., dwell., 30' x 30'; owner, M. J. Towle; builder, C. W. Higgins.

Fairview St., near Train St., dwell., 32' 6" x 41' 6"; owners, Stephenson & Appleton; builders, Noyes Bros.

Tremont St., No. 1405, storage, 25' x 40'; owner, B. & P. R. R. Corporation; builder, F. Folsom.

Boston St., near Hamlet St., mechanical-building, 14' x 30'; owners and builders, John Horsfield & Co.

Bickford Ave., near Heath St., dwell., 21' x 32'; owner, J. Cole; builder, J. J. Bennick.

Ashmont St., dwell., 26' x 34'; owner, G. B. Thayer; builder, D. R. Atwood.

Brooklyn.

BUILDING PERMITS. — *Twelfth St.*, n s, 272' w Third Ave., two-st'y brick factory, tin or gravel roof; cost, $9,000; owner, W. J. Matheson, 20 Cedar St., New York; builder, A. C. Walbridge.

Fifty-second St., s s, 260' e Fourth Ave., 2 two-st'y frame dwells., tin roofs; cost, each, $2,000; owner, John D. Holsten, 143 Forty-third St.; architect, S. B. Bogert.

Freeman St., No. 69, three-st'y frame tenement, felt and gravel roof; cost, $4,400; owner, T. Tapken, 157 Franklin St.; architect, F. Weber; builders, John Hafford and C. Dunkhase.

Newell St., e s, 180' 1" n Van Cott Ave., 3 four-st'y frame tenements, gravel roofs; cost, each, $5,000; owner, Sarah M. Wentworth, 62 Newell St.; architect and builder, Edmund Wentworth.

Central Ave., e s, 26' n Magnolia St., three-st'y frame store and dwell., tin roof; cost, $4,000; owner and builder, Ernest Loerch, 61 Himrod St.; architect, Frank Holmberg.

Third Ave., n w cor. Forty-fifth St., three-st'y brick store and flats, tin roof; cost, $4,000; owner, H. L. Schonberg, s w cor. Third Ave. and Forty-second St.; architect, W. A. Fries.

South Third St., No. 340, three-st'y brick dwell. and stable, tin roof; cost, $3,000; owner and mason, Herman Wild, 340 South Third St.; architect, Th. Engelhardt; contractor, not selected.

Greenpoint Ave., n e cor. Provost St., three-st'y brick storage, gravel roof; cost, $6,800; owners and architects, Young & Gorard; mason, Martin Vogel.

Myrtle Ave., s s, 50' e Stanhope St., two-st'y frame dwell., tin roof; cost, $3,000; owner, Anne Fiama, cor. Park Ave. and Broadway; architect and builder, Jas. J. Carolan.

Nostrand Ave., e s, between Macon and Halsey Sts., three-st'y brick and stone school-house, slate and tin roof; cost, about $100,000; owner, Board of Education; architect, J. W. Naughton; builders, F. J. Kelly and Robert Ferguson.

Waverly Ave., e s, 125' s Greene Ave., three-st'y brick schoolhouse, tin roof; cost, $25,000; owner and architect, same as last; builders, Geo. Philips and P. F. O'Brien.

Van Buren St., n w cor. Reid Ave., three-st'y brick schoolhouse, tin roof; cost, $45,000, owner and architect, same as last; builders, John McQuaid and F. D. Norris.

Stockton St., n s, 235' e Marcy Ave., three-st'y brick schoolhouse, tin roof; cost, $45,000; owner, architect and builder, same as last.

Lorimer St., No. 558, e s, 118' s Norman Ave., three-st'y frame tenement, felt, cement and gravel roof; cost, $4,500; owner, Robert Harrold; architect, M. D. Randall; builder, Stephen Randall.

Stockholm St., No. 133, three-st'y frame tenement, tin roof; cost, $3,500; owner and builder, M. Jeffries, on premises; architect, H. Vollweiler.

Stagg St., No. 278, s s, 150' w Waterbury St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,100; owner, Chas. R. Baker, 244 Washington Ave.; architect, Th. Engelhardt; builders, C. Nieber and J. Auer.

Stagg St., n w cor. Waterbury St., 2 three-st'y frame (brick-filled tenements, tin roofs; cost, $8,800; owner, Mrs. Mary S. Baker, 244 Washington Ave.; architect and builder, same as last.

Power St., Nos. 96 *and* 98, near Leonard St., 2 three-st'y frame brick-filled tenements, tin roofs; cost, $8,400; owner, George Kern, 313 West Thirty-eighth St., New York; architect, H. Vollweiler; builder, E. Schoeb.

Butler St., No. 185, s s, 75' e Bond St., three-st'y frame tenement, tin roof; cost, $3,000; owner, John Clark, on premises; builder, P. Whelan.

Radde Pl., w s, 196' 6" s Herkimer St., two-st'y brick stable and dwell.; cost, $4,000; owner, A. Studwell and P. Devan, Sumpter St. and Saratoga Ave.; architect, P. H. Smith; builders, J. Pawell and T. H. Smith.

Chicago.

BUILDING PERMITS. — Wm. Goldie, three-st'y flats, 2964 Vernon Ave.; cost, $8,000; architect, C. Chapman.

F. W. Wolf, two-st'y factory, 326-330 Hawthorne Ave.; cost, $10,000.

S. M. Parish, two-st'y barn, rear 64 Cottage Grove Ave.; cost, $3,500.

Mrs. E. C. Hancock, two-st'y dwell., 39 Bellevue Pl.; cost, $8,000.

Wm. Mertens, three-st'y flats, 238 Sedgwick St.; cost, $4,000; architects, Forman & Jebson.

P. Kessler, 2 three-st'y stores and flats., 459-461 State St.; cost, $15,000; architects, Bauer & Hill.

P. Koriege, two-st'y store and flat, 298-300 West Twelfth St.; cost, $10,000; architects, Furst & Rudolph.

C. Schroder, three-st'y store and dwell., 981 Milwaukee Ave.; cost, $6,000; architect, Burling.

Fuller & Frost, 3 two-st'y dwells., 3301-3305 Forest Ave.; cost, $12,000; architects, Cobb & Frost.

J. Vollmer, two-st'y flats, 73 Jay St.; cost, $3,500.

Mrs. M. O'Neil, three-st'y flats, 119 Fisk St.; cost, $4,000.

H. Wendt, three-st'y store and dwell., 523 West Chicago Ave.; cost, $4,000.

J. McGrath, two-st'y flats, 2250 Dearborn St.; cost, $3,500.

S. Wolf, three-st'y store and dwell., 308 Thirty-seventh St.; cost, $3,000.

M. Klein, two-st'y dwell., 503 West Congress St.; cost, $5,000.

J. S. & Ida M. Dennis, 2 two-st'y dwells., 1227-1235 Washington Boulevard; cost, $16,000.

A. Schumann, three-st'y dwell., 481 Hulbert St.; cost, $6,000.

A. J. Schnell, 2 three-st'y stores and dwells., 810-812 Milwaukee Ave.; cost, $16,000.

J. Weisel, two-st'y dwell., 178 Larrabee St.; cost, $4,000.

E. Lehman, two-st'y store and flats, 18 Francisco St.; cost, $3,000.

J. C. Howell, 2 two-st'y dwells., 53-55 Grant Pl.; cost, $5,000; architect, H. H. Gage.

J. Mohon, two-st'y store and dwells., 1379 West Twelfth St.; cost, $3,000.

T. Kelly, three-st'y store and flats, 389 Larrabee St.; cost, $4,000.

Mrs. W. Johnson, two-st'y dwell., 10 Elizabeth St.; cost, $6,000.

W. L. Thomas, two-st'y dwell., 588 West Chicago Ave.; cost, $3,200.

T. J. Hankins, three-st'y dwell., 230 Warren Ave.; cost, $6,000.

Mrs. W. How, three-st'y store and dwell., 123 Eighteenth St.; cost, $11,000.

Elkan & Stern, 2 two-st'y dwells., 590-592 Dearborn Ave.; cost, $18,000; architect, J. Huber.

H. Quetschke, two-st'y dwell., 140 Centre Ave.; cost, $4,000.

John Cudahy, two-st'y dwell., cor. Thirty-third St. and Michigan Ave.; cost, $60,000; architects, Burling & Whitehouse.

E. H. Thompson, two-st'y dwell., 301-303 Belden Ave.; cost, $10,000.

W. Jensen, two-st'y store and dwell., 750 West North Ave.; cost, $2,600.

L. Jensen, two-st'y dwell., 80 Le Moyne St.; cost, $2,700.

F. H. Schau, two-st'y dwell., 82 Le Moyne St.; cost, $5,500.

W. E. Smith, 3 two-st'y dwells., 321-325 Rhodes Ave.; cost, $8,000; architects, Wheelock & Clay.

F. Bocka, two-st'y dwell., 473 Twentieth St.; cost, $3,500.

J. S. Martin, three-st'y dwell., 192 North State St.; cost, $12,000.

N. Weber, three-st'y dwell., 91 Hurlburt St.; cost, $4,500.

J. Galles, 2 two-st'y dwells., 233-235 North Market St.; cost, $5,500.

D. Cohen, two-st'y store and dwell., 3340-3342 Michigan Ave.; cost, $27,000; architect, L. B. Dixon.

E. C. Hartwell, 2 two-st'y dwells., 39-41 Pearson St.; cost, $12,000.

J. Joerasek, two-st'y dwell., 82 West Division St.; cost, $4,600.

S. W. Tgrakowski, two-st'y dwell., 335 North May St.; cost, $4,000.

C. Corlett, two-st'y flats, 370 Dayton St.; cost, $3,-300.

Detroit.

BUILDING PERMITS. — The following permits have been granted since our last report: —

Thomas McGregor, two-st'y brick dwell., 40-42 Fremont St.; cost, $6,250.

G. F. Tinan, two-st'y brick dwell., 70 Abbott St.; cost, $5,000.

Peter Thirsen, two-st'y double brick dwell., 383-385 Thirteenth St.; cost, $4,000.

Benjamin Fisher, two-st'y brick dwell., 87 East Montcalm St.; cost, $3,500.

U. Armstrong, three-st'y brick dwell., 92 Washington Ave.; cost, $3,800.

Mary E. Gibbs, two-st'y brick dwell., 60 Erskine St.; cost, $10,000.

Wm. Scott & Co., five-st'y addition to Michigan Stove Works; cost, $14,500.

James Hogan, frame dwell. Seventeenth St.; cost, $3,500.

James B. McKay, frame dwell. Cass Ave.; cost, $4,500.

A. Chapoton, Jr., for Wm. Bealls, five-st'y brick store, Woodward Ave.; cost, $20,000.

W. B. & J. P. Moran, five-st'y brick store, Woodward Ave.; cost, $40,000.

N. Flattery, two-st'y brick dwell., 641 Jefferson Ave.; cost, $15,000.

N. J. Martell, two-st'y brick dwell., 183-185 East Montcalm St.; cost, $3,000.

W. C. Lantern, addition to brick dwell., 308 Howard St.; cost, $3,000.

W. H. Hollands & Son, brick addition to frame dwell., 178 East Montcalm St.; cost, $4,500.

Detroit Soap Co., brick storehouse, Dix Road; cost, $4,000.

William Cowir, brick stores, 44-46 Gratiot Ave.; cost, $25,000.

A. S. Varney, brick dwell., 22 East Alexandrine Ave.; cost, $2,900.

S. J. Martin, brick dwell., 443 Third Ave.; cost, $4,000.

H. S. Peoples, block of brick stores, Michigan Ave., cor. Welch Ave.; cost, $7,500.

C. H. Butler, brick dwell., Woodward Ave.; cost, $15,000.

Herbert Bowen, brick dwell., Forest Ave.; cost, $7,000.

E. C. Bowman, frame dwell., Hancock Ave.; cost, $3,500.

Neil Flattery will erect 2 brick houses on Jefferson Ave., costing $28,000.

St. Joseph Church, East Fort St.; cost, $40,000.

W. H. Holland & Son, brick dwell., Garfield Ave.; cost, $6,000.

H. O'Connell & Co., double frame dwell., 31 Ledyard St.; cost, $4,000.

N. W. Weber, brick dwell., 40 East Forest St.; cost, $5,000.

Kansas City, Mo.

Building Permits.—R. P. Tribble, 2 brick dwells. at 1402 and 1404 Tracy Ave.; cost, $8,000.

Irving Queal, brick block on Tracy Ave.; cost, $5,000.

Mrs. Josephine Shultz, brick dwell. and business house, cor. Ninth and Troost Aves.

Dr. J. H. Duncan, brick dwell., cor. Thirteenth and Tracy Aves; cost, $6,500.

Kansas City White Lead Co., brick business block, cor. Eighth and Mill Sts.; cost, $11,000.

Minneapolis, Minn.

Building Permits.—John Esslinger, three-st'y brick store-building, cor. Cedar Ave. and Third St., s; cost, $5,000.

E. S. Kenney, two-st'y wooden dwell., Park Ave., bet. Twentieth and Twenty-second Sts., s; cost, $6,000.

E. B. Galusha, two-st'y wooden dwell., cor. Thirteenth St. and Yale Pl.; cost, $6,000.

E. B. Galusha, two-st'y double wooden dwell., Yale Pl., bet. Thirteenth and Fourteenth Sts., s; cost, $6,500.

Mrs. Thomas McClary, two-st'y wooden dwell., Orlin Ave., near Seymour Ave.; cost, $3,700.

New York.

Building Permits. — *Clinton St., No.* 148, five-st'y brick tenement, tin roof; cost, $18,000; owner, Edward Harris, 369 Grand St.; architect, Chas. Rentz.

Ludlow St., No. 56, five-st'y and basement brick tenement with stores in basement and first story, tin roof; cost, $10,000; owner, Joseph L. O'Brien, 92 Bowery; architect, F. Jenth.

Mulberry St., No. 23, five-st'y brick tenements with stores, tin roofs; cost, $10,000; owner, J. Searle Barclay, 64 West Thirty-eighth St.; architect, Julius Boekell.

Mott St., No. 39, five-st'y brick tenement with store, tin roof; cost, $9,500; owner, John P. Conlon, 301 West Fifty-fifth St.; architects, Berger & Baylies.

Suffolk St., No. 20, in rear, four-st'y brick workshop, tin roof; cost, $3,000; owners, Mrs. Theresa Schappert, 503 East Eighty-eighth St.; architect, J. C. Burne.

Washington St., No. 659, five-st'y brick tenement, tin roof; cost, $14,000; owner, Margaret Shaughnessy, on premises; architects, A. B. Ogden & Son; builder, P. J. Walsh.

Second Ave., s e cor. First St., 3 five-st'y brick tenements, tin roofs; cost, corner $34,000; others, $16,000 each; owner, Daniel Tier, Westchester, N. Y.; architect, M. Louis Ungrich.

West Eighteenth St., Nos. 148 *and* 150, three-st'y brick stable and dwell., tin roof; cost, $20,000; owner, H. O'Neill, 149 West Twentieth St.; architect, M. C. Merritt.

Twenty-first St., s s, 50′ 3″ w Second Ave., five-st'y brick tenement, tin roof; cost, $12,000; owner, J. C. Bremer, 76 Oakland St., Brooklyn, E. D.; architect, F. Weber.

East Twenty-fifth St., No. 330, five-st'y brick tenement, tin roof; cost, $12,000; owner, Emil Klappert, 328 East Twenty-fifth St.; architects, Berger & Baylies; builders, C. W. Klappert's Sons.

Eighth Ave., No. 543, four-st'y brick store and tenement, tin roof; cost, $14,500; owner, Emma Meier, 303 West Thirty-eighth St.; architect, M. Louis Ungrich; builders, Prodger Brothers and Alexander Moore.

Third Ave., Nos. 1521 *and* 1523, 2 five-st'y brick tenements and stores, tin roofs; cost, each, $18,000; owner, Eugene D. Bagen, 532 East Eighty-seventh St.; architect, Fred. T. Camp.

West Ninety-ninth St., No. 20, five-st'y brick tenement, tin roof; cost, $25,000; owner, Wm. B. Pettit, 444 West Thirty-fourth St.; architects, A. B. Ogden & Son.

Eighth Ave., w s, 75′ s Ninety-fourth St., 2 five-st'y brick tenements, tin roofs; cost, each, $20,000; owner and builder, Abraham E. Benson, 63 North Moore St.; architect, N. M. Whipple.

Grand Boulevard, e s, 67′ 4″ s One Hundred and Fourth St., five-st'y brick flat, tin roof; cost, $24,000; owner, Martha A. Lawson, 521 West One Hundred and Fourth St.; architect, M. Louis Ungrich.

Seventy-second St., n s, 149′ 6″ e Tenth Ave., 5 four-st'y brick (stone-front) dwells., tin roofs; cost, each, $25,000; owner, Robert Irwin, 42 West Fortieth St.; architects, Thom & Wilson.

One Hundred and Fifth St., s s, 375′ e Tenth Ave., five-st'y brick flat, tin roof; cost, $55,000; owners, Hoefer & Vincent, 446 West Fifty-seventh St.; architects, Thom & Wilson.

Tenth Ave., e s, 75′ n Ninety-eighth St., 2 five-st'y brick flats, tin roofs; cost, each, $19,000; owner and builder, David Christie, 413 West Fifty-seventh St.; architect, J. F. Wilson.

One Hundred and Twenty-second St., n s, 75′ e Seventh Ave., 2 three-st'y and basement brick dwells., tin roofs; cost, each, $12,500; owner and builder, Isaac A. Hopper, 214 West One Hundred and Twenty-third St.; architect, R. S. Townsend.

Sixth Ave., s w cor. One Hundred and Twenty-third St., 9 four-st'y and basement brick (stone-front) dwells., tin roofs; cost, each, $20,000; owner, A. B. Van Dusen, 2039 Sixth Ave.; architect, Chas. H. Beer.

One Hundred and Forty-first St., n s, 150′ e Eighth Ave., 2 four-st'y brick tenements, gravel roofs; cost, each, $12,000; owner, Mark S. Karr; Mark S. Stevens, builder and attorney for owner, 226 East One Hundred and Twenty-seventh St.; architect, J. H. Valentine.

One Hundred and Forty-second St., n s, 100′ e Eighth Ave., 4 four-st'y brick tenements, gravel roofs; cost, each, $12,000; owner, etc., same as last.

One Hundred and Forty-sixth St., n s, 175′ w Tenth Ave., five-st'y brick tenement, tin roof; cost, $10,000; owner, Martha Garry, One Hundred and Forty-third St., w of Eighth Ave.; architect, James S. Wightman.

West One Hundred and Twenty-sixth St., No. 102, three-st'y and basement brick (stone-front) dwell., flat and mansard roof of tin, slate and copper; cost, $14,000; owner, Henry O'Neill, 222 West Fifty-seventh St.; architect, Wm. Collins; builder, G. H. Hardy.

Lincoln Ave., n e cor. Southern Boulevard, five-st'y brick piano-factory, tin and slate roof; cost, $30,000; owner, John B. Simpson, Jr., 12 West One Hundred and Twenty-ninth St.; architects, A. B. Ogden & Son.

One Hundred and Fifty-first St., n s, 275′ w Courtlandt Ave., two-st'y frame tenement, tin roof; cost, $6,000; owner, Christina Ludwig, 677 East One Hundred and Fifty-second St.; architects, Schmidt & Garwin; builder, not selected.

Alterations. — *Fiftieth St. to Fifty-first St.*, and *Sixth to Seventh Aves.*, altered for car-house and stables, iron beams and columns; cost, $20,000; owner, Broadway & Seventh Ave. R. R. Co., on premises; architect, S. D. Hatch.

West Thirty-first St., Nos. 223 *and* 225, raised one st'y, mansard and flat roof; cost, $4,000; owner, Rev. Chas. Da Nazzano, 135 West Thirty-first St.; architect, J. W. Cole; builder, J. Jordan.

East Fifty-third St., No. 1, three-st'y brick extension, tin roof; cost, $14,000; owner, Jeremiah W. Curtis, on premises; architect and builder, Richard V. Breese.

West Forty-fifth St., No. 60, rear altered, iron beams furnished; cost, $4,000; owner, T. M. Stewart, on premises; builder, E. Gridley.

East Fourteenth St., No. 218, four-st'y and basement brick extension, tin roof; also internal alterations; cost, $6,000; owner, Chas. J. Goeller, 212 East Fourteenth St.; architect, W. Graul.

East Eleventh St., No. 528, one-st'y brick extension, tin roof; cost, $5,000; owner, George Diebl, on premises; architect, F. Ebeling; builder, not selected.

East Sixty-third St., No. 2, altered to three-st'y dwell.; cost, $10,500; owner, C. A. Postley, 51 Park Ave.; architect, R. H. Robertson; builders, L. N. Crow and Smith & Bell.

One Hundred and Thirtieth St., n s, 100′ w Eleventh Ave., new brick smoke stack; cost, $6,000; owner, G. H. H. Butler, 126 East Twenty-ninth St.; architect, G. B. Pelham; builders, Van Dolsen & Arnott.

Grand St., No. 458, attic raised to full st'y; also, two-st'y brick extension, tin roofs; cost, $4,000; owner, D. Openheimer, on premises; architect, E. W. Greis.

Philadelphia.

Building Permits. — *Point Breeze*, one-st'y pump house, 28′ x 33′; Atlantic Refining Co., owners.

Point Breeze, one-st'y storehouse, 75′ x 80′; Atlantic Refining Co., owners.

Point Breeze, one-st'y canning shop, 57′ x 92′; Atlantic Refining Co., owners.

Hanover St., n of Thompson St., three-st'y dwell., 17′ x 56′; Jno. S. Boldt & Son, contractors.

Seventeenth St., cor. Christian St., three-st'y dwell., 18′ x 56′; Guilbert & Keefe, contractors.

Forty-ninth St., cor. Woodland Ave., 2 two-st'y dwells., 16′ x 43′; Michael Dehaven, contractor.

West Fetter Lane, No. 10, three-st'y mill, 30′ x 80′; J. B. Stanaur, contractor.

Walnut St., w of Forty-second St., 2 three-st'y dwells., 28′ x 59′; Jacob Myers, contractor.

Jefferson St., No. 2523, two-st'y dwell., 17′ 6″ x 50′; E. Schmidt, contractor.

Long Lane St., cor. Federal St., 5 two-st'y dwells., 16′ x 45′; Thos. S. Marshall, owner.

Cherry St., e of New St., 8 two-st'y dwells., 14′ x 44′; W. Steele, contractor.

Hirst St., No. 506, three-st'y dwell., 14′ x 27′; F. Fink, owner.

Sixth St., cor. Venango St., two-st'y stable, 15′ x 30′; John Mander, contractor.

Broad St., s of Barks St., four-st'y dwell., 21′ x 85′; Jas. E. Cooper, contractor.

Turner St., above Erie Ave., two-st'y dwell., 16′ x 56′; A. Zim, owner.

Grays Ferry Road, cor. Seventy-second St., two-st'y dwell., 18′ x 32′; B. T. Green, owner.

Broad St., n e cor. Washington St., 2 sheds, 42′ x 150′; G. B. Newton & Co., owners.

Fairhill St., n of Cumberland St., one-st'y shed, 20′ x 60′; Geo. Kessler, contractor.

Second St., n e cor. Willow St., five-st'y factory, 30′ x 57′; Geo. Kessler, contractor.

Ridge Ave., n e cor. Dauphin St., three-st'y dwell., 17′ x 56′; W. Albrecht, owner.

Twelfth St., s of Wolf St., three-st'y dwell., 18′ 4″ x 44′; W. Albrecht, owner.

Eleventh St., cor. Christian St., addition, 22′ x 30′; A. Ewing, contractor.

Haverford St., w of Sixty-fifth St., 2 two-st'y dwells., 16′ x 42′; Leger & Bro., contractors.

Armat St., w of Hancock St., two-st'y store, 20′ x 32′; A. Jenkinson, owner.

North Sixth St., No. 2131, one-st'y store, 19′ x 71′; D. C. Schuyler, owner.

Haines St., bet. Chew and Musgrove Sts., 2 two-and-one-half-st'y stores, 16′ x 42′; J. Broadbent, owner.

Ninth St., cor. Mifflin St., 2 two-st'y dwells., 15′ x 30′; H. Weisner, contractor.

Pine St., w of Sixty-third St., one-st'y mill, 19′ 6″ x 65′; Wm. Douglass, contractor.

Jefferson St., s e cor. Winchester St., three-st'y store, 17′ x 42′; F. Gillett, contractor.

St. Louis.

Building Permits. — Forty-four permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

E. Stover, 2 adjacent two-st'y brick dwells.; cost, $7,000; A. Beinke & Co., architects; A. J. Riddle, contractor.

Wm. Lesser, 3 adjacent two-st'y brick dwells.; cost, $8,000; A. Beinke & Co., architects; Beckmeier & Rieckmann, contractors.

John Leicht, two-st'y brick dwell.; cost, $2,700; Wm. Gahl & Co., contractors.

McCreeney Heirs, alterations at the Laclede Hotel; cost, $10,000; J. S. Taylor, architect; Higgin & Bro., contractors.

Schlegel, two-st'y brick dwell.; cost, $2,500; F. H. Goss, contractor.

Mrs. E. Meyer, two-st'y brick dwell.; cost, $2,800; Henry Ellermann, contractor.

Henry Feldwisch, two-st'y brick dwell.; cost, $2,500; Henry Ellermann, contractor.

A. Temme, two-st'y brick dwell.; cost, $2,500; S. T. Simmons, architect; H. Schulte, contractor.

Chas. A. Lee, two-st'y brick dwell.; cost, $4,000; Peabody & Stearns, architects; David Davis, contractor.

Henry Timpken, four-st'y brick carriage factory; cost, $10,000; McGrath, architect; F. C. Bonsack, contractor.

Mrs. E. A. Clark, five-st'y brick business house; cost, $18,000; I. S. Taylor, architect; B. Weber & Co., contractors.

Geo. Blackman, two-st'y frame dwell.; cost, $3,000; Peabody & Stearns, architects; F. Lane, contractor.

St. Paul, Minn.

Building Permits.—One-st'y brick store-room, s s of East Third St., bet. Robart and Minneseta Sts.; cost, $2,000; owner, National German American Bank.

Two-st'y frame double dwells., n s of Iglehart St., bet. Western and Arundel Sts.; cost, $5,000; owner, C. L. Larpentern.

Two-st'y frame store and dwell., w s of Rice St., bet. Wazota and Melford Sts.; cost, $5,000; owner, P. G. Olson.

Two-st'y frame dwell., s s of Hennipin St., bet. St. Albans and Grotto Sts.; cost, $2,000; owners, Cochran, Rice & Walsh.

Two-st'y brick store and dwell., e s of Dakota Ave., bet. Colorado and Delos Sts.; cost, $5,000; owner, Mr. Sheibele.

Two-st'y brick veneer store and dwell., e s of Fort St., bet. Ninth and Tenth Sts.; cost, $3,000; owner, John Schreil.

Two-st'y frame dwell., s s of Arch St., bet. Jackson and Sylvan Sts.; cost, $2,000; owner, John Lalley.

Four-st'y brick block stores and hotel, n s of Fifth St., bet. Wabasha and Cedar Sts.; owner, A. R. Capstrant.

Two-st'y brick veneer dwell. and store, n s of Thirteenth St., bet. Mississippi and Orient Sts.; cost, $4,800; owner, W. F. Stetson.

Two-st'y frame dwell., e s of Broadway, bet. Tenth and Eleventh Sts.; cost, $2,400; owner, Andrew Nippolt.

Bids and Contracts.

Cincinnati, O.—The following are the bids for furniture for the custom-house: —

A. H. Andrews & Co., Chicago, $23,510.30; Tomlinson & Carsley, Chicago, $30,511.25; Edward E. Swiney, Chicago, $19,827 (*accepted*); H. J. Fitzpatrick & Co., New York, $22,003.10; Middleton Furniture Manufacturing Co., Middleton, Pa., $25,637.85; Phœnix Furniture Co., Grand Rapids, Mich., $22,350.48; the Robert Mitchell Furniture Co., Cincinnati, $23,310.

The following are the bids for gas-fixtures for the custom-house:—

Iden & Co., New York, $9,609.60; Bergman & Co., New York, $9,583.50; Mitchell, Vance & Co., New York, $9,639.45; R. A. Robbins, New York, $10,951; R. Hollings & Co.; Boston, $8,772.75; the Horn, Banner and Forsyth Manufacturing Co., Philadelphia, $10,129; the Horn, Banner and Forsyth Manufacturing Co., Philadelphia, $9,307.50; the Horn, Banner and Forsyth Manufacturing Co., Philadelphia, $7,375.25; the Horn, Banner and Forsyth Manufacturing Co., Philadelphia, $6,355.25; McHenry & Co., Cincinnati, $9,444.40 (*accepted*).

Cincinnati, O., Buffalo, N.Y., and Frankfort, Ky.—The following are the bids for standard furniture for United States buildings at Cincinnati, O.; Buffalo, N. Y., and Frankfort, Ky.: —

A. H. Davenport, Boston, $15,960; Middleton Furniture Manufacturing Co., Middleton, Pa., $17,862.30; R. A. Robbins, NewYork, $21,513.80; Hersee & Co., Buffalo, N.Y., $15,636; Tomlinson & Carsley, Chicago, $19,806.50; A. H. Andrews & Co., Chicago, $15,726; Edward E. Swiney, Chicago, $15,937.90; the Robert Mitchell Furniture Company, Cincinnati, $13,839.53 (*accepted*).

Peoria, Ill.—The following is an abstract of the bids for stone-work and setting, and for brickwork of the post-office, etc.: —

P. G. Straub & Co., stone-work, $12,990.

E. R. Brainerd & Co., stone-work, $11,485; stone and brick work, $15,425.

Balliance & Jans, stone-work, $13,700.

F. B. Hasbrock, brickwork, $4,775.

A. J. White, brickwork, $4,520.

Washington, D. C. — The Postmaster-General has awarded the contract for supplying steel mail-catchers, for the entire service, during the coming year to Manly & Cooper M'f'g Co., cor. Forty-second St. and Elm Ave., Philadelphia, on their bid of $3.38 each.

The other bids of which there were 12, varied from $3.43 to $6.95. They will be used on the mail-cars throughout the United States.

COMPETITION.

County Jail. [At Montgomery, Ala.]

Office of the Board of Revenue, of Montgomery County, Montgomery, Ala., July 6, 1885.

Plans and specifications for the construction of a jail in the city of Montgomery, Ala., will be received by the Board of Revenue, of Montgomery County, **until Monday, July 27th, 1885, at 12 m.**

Said jail to hold at least 100 inmates, and contain office and 4 rooms for jailor, kitchen, dining-room, hospital, misdemeanant and solitary cells for both male and female, whites and blacks separate, heating, ventilating and water arrangements, all after the modern improvements.

Length of building not to exceed 100′, and width not more than 44′. This provides for light on each side of the building. Size of lot 50′ x 160′.

The building to cost not more than $35,000.

The successful architect to receive 2 per cent on the cost of the building.

The Board of Revenue reserves the right to reject any and all plans and specifications.

By order of the Board of Revenue.

499 W. H. HUBBARD, Clerk.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 500.

JULY 25, 1885.

Entered at the Post-Office at Boston as second-class matter.

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WE learn from *Building* that an exhibition of architectural drawings is to be held next winter in New York, in connection with the Eighth Annual Exhibition of the Salmagundi Club, at the American Art Galleries, 6 East Twenty-third Street. The date of opening is fixed at January 11, 1886, and the drawings will be shown until February 1. Messrs. Cyrus L. W. Eidlitz, Richard M. Hunt, Robert H. Robertson, William B. Tuthill, Frederick C. Withers and F. A. Wright, with Professor William R. Ware, will act as the Hanging Committee, and will constitute the jury to decide upon the acceptance or rejection of the drawings. A general invitation is soon to be issued to the architects of the country, specifying the character of the drawings which will be most desirable for showing, and giving particulars of the exhibition. There is so much excellent material of the kind in this country that a very interesting and creditable collection of drawings ought to be easily brought together, and the association of these with the purely artistic work of the Salmagundi Club will give the exhibition just the sort of spice which it needs. We hope that the Hanging Committee will decide to admit photographs of executed work, as well as drawings. Although this would be rather an innovation, there is no question that the public takes much more interest in photographs of buildings than in drawings of them, and we are inclined to think that the public is not very far wrong in its preference. Great as is the pleasure which architects take in clever drawings, they know well enough that the picturesque dash of a drawing often hides the baldness or ill-studied proportions of a design which loses entirely in execution the charm which a brilliant perspective sketch lent to it, while scores of beautiful buildings, worthy of comparison with any in the world, obtain but a limited reputation for themselves or their designers, simply because the latter have not thought it worth while to hire professional draughtsmen to translate into clever linework for exhibition or publication the effects which they have succeeded in obtaining in the architects' true materials of expression, wood, brick and stone. It is not too much to say that an artist like Prout, or Haig, or Norman Shaw, using the license which is generally allowed to perspective draughtsmen, could represent any building, not spoiled with vulgar ornament, as interesting and attractive, while a poor perspective would discredit the most beautiful building ever designed; and apart from the question of public appreciation, the exhibition of architectural work by means of photographs would not only afford the fairest means of comparing the design of the building represented, but would induce many architects, particularly those at a distance from the great cities, who have little use for fancy draughtsmanship, to contribute illustrations of their work.

IT is rather unfortunate that the so-called Old Mill at Newport, the most interesting ruin in the country, should have become of late an object of so much attention as to invite propositions for restoring or otherwise improving it. For some mysterious reason, the ivy, which had for so many years covered it with its beautiful protecting mantle, was not long ago removed, and the rude masonry seems since to have suffered rapid deterioration. The stone-work is a coarse rubble, laid, apparently, in lime mortar, with very wide joints, if, indeed, the masses of mortar between the small stones can be dignified with the name of joints; and some such defence against the weather as the ivy leaves afforded seems to have been essential to the preservation of the ruin in its present condition. For want of this, or from some other less obvious cause, the walls are now found to be badly cracked, and the mortar-joints disintegrated, and some of the stones have fallen out. To prevent further mischief, it is now proposed to replace the fallen stones and point the whole work, inside and outside, with cement, retaining, however, as far as possible, the present rude effect of the masonry. At the top of the circular wall it is proposed to form a coping of Portland cement, to prevent the penetration of water into the masonry from above. Although various alterations and repairs have already been made in the building, they are so ancient as to afford, perhaps, when understood, important indications in regard to the history of the structure, and it will, of course, be advisable to avoid interfering with or obscuring these indications. Whether a cement pointing all over the work will hide anything of value is perhaps doubtful, but so much is to be learned from the form and material of mortar joints in old masonry that most people would decidedly prefer to have them left undisturbed; and if a simple shed over the ruin, with sparing consolidation of the cracked masonry, would suffice to preserve it, there would certainly be an advantage in adopting that means.

THE discussion in the French Congress of Architects upon the question of establishing finally the Association of Mutual Defence, about which so much interest has been excited, seems to have been a rather lively one. Something more than one hundred and fifty architects in all parts of France have already signed the articles of association, and it was confidently expected that enough more would join, on the occasion of the Congress, to complete the number of three hundred, which the provisional plan had set as the limit which should be reached before the association should be definitely organized; but this expectation was not fulfilled, and on the day set apart for the discussion of the matter in the Congress only about sixty members were present. This made it evident that the full number of adherents could not be obtained without further exertion, and perhaps considerable delay, and the question which naturally presented itself first for discussion was whether the limit of three hundred should be abandoned, and the Association organized at once, with the membership already secured. Although, considering the small entrance fees and assessments levied on the members, there was apparently some risk in assuming too soon the responsibilities with which the Association is to be charged, the members present showed themselves so impatient to avail themselves of the advantages which it offers that a motion in favor of immediate organization was passed by a great majority of votes. This action seems to have met with the approval of the distinguished gentlemen who have done most to promote the movement, for, although they have forborne to urge anything like hasty or rash action, one of them very sensibly pointed out to the meeting that no means of attracting new members, and thereby strengthening the Association, would be so effective as an example of a case undertaken by it on behalf of one of its members, and pressed to a conclusion.

ANOTHER point which was discussed at length and settled, as we think, in the most judicious way, was the question of accepting or rejecting that article in the draught of the constitution of the Association which provides that the ordinary entrance fee shall be six dollars, and the annual dues two dollars and a half, but that special assessments may, in case of need, be levied on the members to pay extraordinary expenses. Although the fixed dues, as proposed, are evidently very low, so low, in fact, that the Association is likely to find its usefulness restricted for lack of funds for its work, the feeling of unwillingness to enter into engagements of uncertain amount, which is very strong among the prudent French, proved so strong in the meeting that the clause relating to extra assessments was, by a majority of one, stricken out. The promoters of the movement, although they knew better than

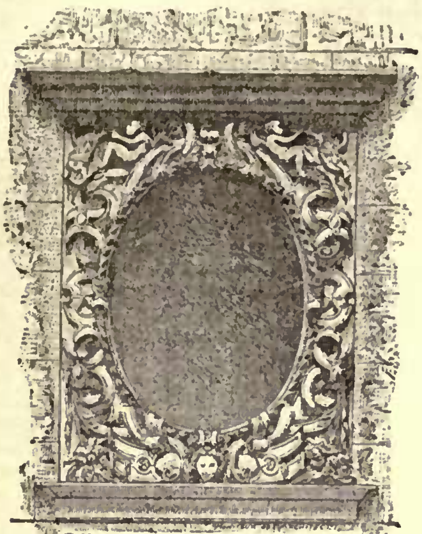
any of the others the disproportion of the fixed dues to the probable expenses of the Association, as well as to the advantages which it will be in a position to afford, submitted gracefully enough to the rejection of this part of their plan, feeling, as they said, that if the Association were once constituted, experience would soon show how much money could be advantageously spent in its work, and how it would best be raised. No further change of importance was made in the constitution and by-laws as proposed by the committee on organization, and they were then adopted as a whole. Nothing further then remained except to order the filing of these documents in the office of the prefect, who, under the French laws, then issues the certificate of incorporation; and a vote was passed directing that this should be done, providing, however, that a final revision should be made by the judicial sub-committee, with authority to make such alterations in form or wording as might seem necessary. The first general meeting of the incorporated Association is to take place in November next, and until that time the committee on organization will administer its affairs as a provisional executive committee.

A NEW and rather surprising illustration of the common law relative to "ancient lights" is furnished by a recent decision in England, in the case of Bullers *versus* Dickinson. It seems that an old building, three stories high, stood upon a certain street, projecting some feet over the street line. The building, which was once a toll-house, had been altered into a shop, and a large window had been put in the front wall of the first story. The window had been in long enough to have acquired a right to light under the ordinary rules, when the city authorities decided to buy and remove the portion of the building to which it belonged, in order to give the street in front of it the full width. The old wall was not parallel to the street line, and it was necessary to cut off a portion of the building four feet in depth at one end, and seven feet nine inches at the other; and the owner, rather than have his property so extensively mutilated, pulled the building down, and erected a one-story structure on the site, with a front on the new line, and a shop window in it. A large building, which was constructed on a neighboring lot, was then found to interfere with the light of the new window, and the owner of the shop brought suit to prevent the infringement of what he claimed to be his ancient right to unobstructed light. The proprietor of the offending edifice maintained that as the window for which his adversary claimed the protection of the court was in a new wall, in a different position from the old one, and forming part of an entirely new building, of different plan and dimensions from the old one, it could not properly be regarded or entitled to all the rights which had been enjoyed by the window to which it succeeded; but the judge decided that even such modifications in the circumstances as those which had taken place did not amount to an abandonment of any original right, and ordered a decree for the plaintiff.

A NEW scientific association, comprising a small number of very distinguished members, has been formed in Paris under the name of "*Scientia*." The objects of the association is primarily the promotion of scientific knowledge, but the members have taken advantage of the present smallness of their number to give to their meetings something of a social character, and enliven them with a dinner, at which, as with many clubs which meet only occasionally, some eminent person is usually present as a guest. At the last of these meetings, as we learn from *Le Génie Civil*, the guest of the evening was General de Nansouty, the originator of the plan for establishing an observatory on the top of the Pic du Midi, about which we have already had something to say. This mountain constitutes a somewhat isolated spur of the Pyrenees, and rises to a height of more than seven thousand feet above the sea. Although not high enough to reach the limit of perpetual snow, the top of the Pic du Midi is exposed to terrible winds, and in winter is buried in snows which make the ascent to it impracticable. Nevertheless General de Nansouty, who had been strongly impressed with the value of the mountain, commanding, as it does, the great southern plain of France, as a site for a meteorological station, resolved to attempt a thing that the mountaineers said was impossible, and to pass a winter in a hut at the very summit of the peak. He collected materials, and during the summer constructed a little cabin, which he stocked with provisions and instruments, and put in communication with the outer world by means of a telegraph wire. Before the winter fairly set in, he established himself in his little hut, and there, cut off by the snow from either rescue or retreat, he stayed until spring opened again the way down to the plain. In spite of cold, hunger and loneliness, he pursued his observations, and kept his records, fortifying himself under adversity, as M. Tissandier said in introducing him to the club, by remembering that he was a soldier, bound by his profession not to yield to any force which he had not tried his strength against and found irresistible. Like a soldier, too, the General remembered, through all his privations, to gain what advantage he could for the benefit of the poor people about him, and used his telegraph to send word to the farmers on the plains when the melting of the snows on the peak showed that an inundation would soon follow below. After a few winters spent in this manner, a permanent and well-equipped station was, as our readers know, built in place of the little cabin, and a staff of observers established there; and within a short time M. Raphael Bischoffsheim has promised to build an astronomical observatory by the side of the meteorological station. If this promise is carried out, the astronomical observatory of the Pic du Midi will probably soon become as useful to science in its own way as the meteorological observatory. The experience of every year shows more clearly the advantage of placing astronomical observatories, particularly those equipped with powerful telescopes, on the tops of mountains. The one thing essential to the use of high powers in the telescope is a clear atmosphere, and, pure as we think our atmosphere is in clear nights, its transparency is so far inferior to that of the air about mountain tops that, seen from the latter, the atmosphere of the plain always appears filled with haze, which certain conditions of sunlight show to be due to perpetual clouds of dust, kept by gravitation in the lower regions of the air.

THE *Schweitzerische Bauzeitung*, which takes special pains to publish sketch plans and elevations of the best drawings submitted in public competitions in its own country gives in the last number the three prize designs for a primary school-building at St. Gallen. St. Gallen is a considerable city, and the building is intended to be a large one, accommodating about eight hundred children; and the manner in which the Swiss conduct their schools is so similar to that which prevails here that, as with most of their school plans, the present designs have much that is instructive for us. Indeed, except for the gymnasium, which, as in all Swiss and German schools, occupies a large hall in direct connection with the main floor of the building, all the plans might readily be supposed to have been submitted in competition for one of our best city schools. As usual in Switzerland, boys and girls go to the same school, but occupy different rooms in the building, and all the plans show accordingly six rooms on each floor, connected by a wide corridor, which is, however, divided across the middle by a partition, and is reached from the outside by two separate doors. Each of the six class-rooms is seated for about forty-five pupils, one plan showing single desks, after the best American plan, and the others double desks. All the rooms are lighted from the left of the pupils as seated, but in some cases windows are placed also at the back of the pupils in the corner rooms. In no case, however, is a window shown in front of the pupils, or on the right-hand side. The teacher's platform, in the two plans placed highest, is shown near the corner of the room, instead of the middle, an arrangement sometimes, though rarely, seen here. No preference seems to be shown for one side over the other, although the designers have generally placed the desk at the left-hand corner of the room, as the pupils face, which obviously gives it a better light than it would have in the opposite corner. The doors are in most instances, though not always, at the teacher's end of the room, and one of the plans, curiously enough, shows what appears to be a porcelain or brick stove, after the Swiss manner, in each room. The provision for ventilation is, according to our ideas, very inadequate, nothing but flues in the brick partition walls being shown for the purpose, except in one plan, where a shaft, warmed, apparently, by a smoke flue inside, serves to ventilate the lavatories, which certainly need it, being, in all the plans, placed close to the entrances, and opening out of the main hall. Considering the tender age of the children to be accommodated, this is perhaps a good arrangement in itself, but nothing short of a strong forced ventilation could prevent it from becoming a source of offence.

FRENCH ARCHITECTURE OF THE NINETEENTH CENTURY. — I.



Window, (œil de bœuf) in Hotel at Riom, France. (ch. of XVI cen.)

THERE is in the French mind a notable combination of respect for precedent and law with love of personal freedom; of a regard for discipline and subordination with an inextinguishable individuality. This shows itself in art in a keen sense of organization and subordination, and a great fertility and variety in detail; and with their feeling for elegance of form, and the liveliness of their invention goes far at any rate to explain the superiority which they show over other nations in the fine arts, at least as far as concerns excellence of form. Their monarchial and military habits have some relation to these characteristics, — perhaps of cause, perhaps of effect. At any rate no one lives among the French without noting their instincts of command and of subordination, and no one examines their art without marking its excellence in technical discipline. Their tendency to disciplined form in art has of course been greatly steadied by the influence of the Institute, the Academy and the Ecole des Beaux Arts, which have preserved an uninterrupted traditional influence from their foundation. No doubt, like every conservative influence, while this has been a great safeguard against lawlessness,—not always against extravagance, as we shall see,—it has done something to check the freedom of individual and even of general development.

A result of these characteristics in French art is that the French have not usually been innovators. Any radical change in art, such as has two or three times come over Christendom, since the invention of pointed Gothic, which does belong to them, has always begun outside of France, and the French have followed more or less slowly, where others have led; and when after other nations they have taken up new fashions in art, they have rather interwoven them with their own previous habits, and modified them till they seem characteristic of themselves, than surrendered themselves fairly to them.

Thus, when the French court introduced the Renaissance from Italy, it took in French hands a French dress, and was for a long time far more mediæval than Classical in feeling. The high roofs and tall chimneys and pinnacled dormers, and corbelled cornices of the French chateaux held their place with the Italian orders through two or three centuries, and it was not till the time of the later Bourbons, that what was traditionally Classical architecture wore any classical look to France.

The beginning of this century however, found all Europe given over to classicism, and France gone mad for it. The discoveries of Stuart in Athens had aroused the interest of all French as well as English artists, and Leroy and other Frenchmen had followed him. The Revolution had turned everything into Classic as far as possible in politics, society, art and religion even.

Napoleon himself was full of the Classic mania in art, and his court painter, David, who was a very dictator in art, pervaded every department of it with his uncompromising Classic spirit. Two young Frenchmen, Percier and Fontaine, pensioners of the French Academy at Rome, fell to designing first stuffs and furniture, afterwards monuments and interiors of buildings in the prevailing style. They built the Arc du Carousel in imitation of the Arch of Septimus Severus. The Bourse, the Madeleine, the Arc de l'Etoile were begun in the early days of the Empire; the Bourse and the Madeleine were as purely Classical buildings as their respective architects Brogniart and Vignon knew how to make them. In the Arc de l'Etoile, designed by M. Chalgrin, French individuality again asserted itself, and though the general form and the style of the details are Classical, they are not the form and details of any one model, and the whole is as distinctly French as it is magnificent. The Madeleine was, as is known, a scheme of Napoleon's, for a temple of glory in honor of the soldiers of the *Grande Armée.* When the competition for the design was in judgment before the Institute he wrote back from his camp, "It was a temple that I wanted and not a church. I meant to have a monument such as was to be found in Athens, and such as was not to be found in Paris." The Madeleine is such a monument as never was nor would have been in Athens. It was meant to be Greek, and is commonly reputed pure Greek, I believe, but it is Roman in its proportions and ordinance, and more Roman than Greek in its details. It may be said in fact that the French, at least at that time, were reproducing the Greek in very much the same way that the Romans did; that is, they adopted a Greek form and carried it out, rather as they assumed the Greeks would or should have carried it out than as they would have found to be Greek, if they had studied their models with sufficient exactness; but with this advantage in favor of the French, that being much nearer to the Greeks in artistic feeling, than were the Romans, they produced a result more like the Greek. However, the Madeleine is beautiful and grand, and like the Walhalla at Regensburg, valuable as a single very fair example to our day of what a Classic building was, but with its grandeur sensibly diminished by its position in a wide open space, surrounded by very high buildings, and still more by the painful way in which its huge columns, which should have been monolithic or built of a few complete drums, but could not, are cut into small sectors of slices. The Bourse, as is well known, is simply a rectangular cella, surrounded by an open peristyle which with its entablature and attic makes its only significantly visible feature. An incident of its construction is interesting as an example of the difficulties which the unpliability of the architecture of Vignola brings on architects, and of a luckier chance than usual in escaping from them. M. Brogniart had adopted for his building, we read, the Ionic order, as the symbol of "that elegance without luxury, which naturally suits with industrial wealth." Unhappily, when the foundations had been laid, and so disposed that the inter-colomniations were irrevocably fixed, the purposes of some of the rooms under the portico were so changed as to require that their ceiling should be raised. This called for an order of higher columns, but the Ionic columns could not be lengthened without ruining the order. There was nothing for it then, but to use instead the Corinthian column, which with the same inter-columniation, would be two or three feet higher, being ten diameters instead of nine in height. This was done, and the practical wants of the building were so far met; but M. Brogniart lost the expression he had striven to give to his "monument."

The Bourse and the Madeleine, the Corps Legislatif and the colonnade of the Louvre are typical examples of what the French call *Architecture Colossale,* that is to say architecture in which a single order is made to cover two or more stories, and with or without the help of an attic, to do duty for a whole façade. They are very grand, and I for one should be sorry not to have them to look at; but they seem like monuments made and kept for show, not like buildings desirable or attractive for any use. They have the merit, however, of not trying to reconcile the irreconcilable: the windows which light the two or three stories are not brought to the front to contradict the singleness of impression due to the one controlling order.

With the Empire the time for great undertakings in France ended. The impulse given by the Republic and by Napoleon spent itself, and little was done in architecture during the Restoration, but to carry on some of the work already undertaken. The Chapelle Expiatoire in Paris was built to consecrate the spot where Louis XVI and Marie Antoinette were buried, and commemorates the Swiss Guard, who gave their lives in their defence. It was designed by Percier and Fontaine, and is a small chapel, in form a Greek cross with central dome, of elegant Classic detail, noticeable for the skilful way in which the apparent size of the dome is increased by somewhat contrasting the four main arches which support it, a treatment employed on a large scale by Michael Angelo in St. Peter's, but neglected with loss by other men who have built domed churches.

The reign of Louis Philippe was at first almost as unproductive as that of Charles X. The Bourse, the Madeleine, the Arc de l'Etoile were finished. The Obelisk of Luxor, a monolith seventy-five feet high, was brought from Egypt and set up in the Place de la Concorde. But during this period of non-achievement, while the Classic fervor had died away, new interest in archæology had awakened. The seasons of productive activity are apt not to be those of study and acquisition. Accordingly, this apparently inactive time was in truth a time of remarkable growth. The English, who a century before had set on foot the Greek revival, had now turned their attention to mediæval architecture, and a Gothic revival was already in full movement among them. The new interest spread to France, and was increased by the works of Lenoir, Laborde, Taylor, Nodier, and others. Victor Hugo, by the publication just after the accession of Louis Philippe of "*Notre Dame de Paris,*" gave a powerful impetus to popular interest in mediæval art and especially architecture, and the whole so-called romantic movement in literature and art throughout Europe, lent its influence in the same direction. M. de Caumont, to whose energy the study of archæology in France owes as much as to anybody, founded the *Société Archéologique,* and by writing and lectures and meetings for discussion encouraged his favorite study. In 1837 was established by the Government the *Comité des Arts et Monuments,* for the preservation and restoring of important old French architectural works. Through their influence most of the conspicuous remains of mediæval work in France have been sought out and put in the charmed list of "Monuments Historiques," which makes them in a sort pensioners of the Government, secures them against depredation and decay, and provides in a measure for their restoration. Two architects whose names are familiar to most of us, MM. Lassus and Viollet-le-Duc, interested themselves especially in the critical study of mediæval architecture. Under their care was undertaken the restoration of the Ste. Chapelle, and of Notre Dame at Paris; and one or other of them had charge of the principal restorations that were undertaken out of Paris.

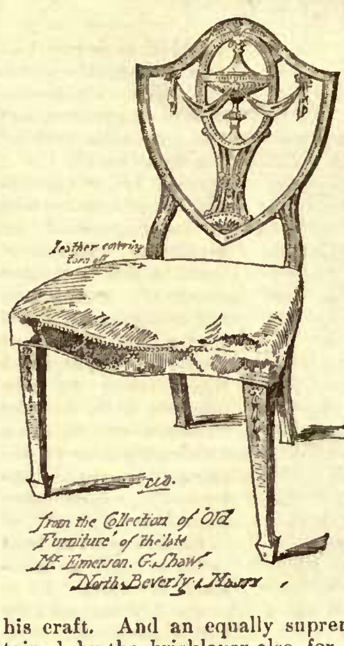
Meanwhile the Government was doing its work in analogous ways. Napoleon's expedition to Egypt, and the voluminous description of the country and its remains, undertaken by his order, had already

opened a field of study; and if the French found Egyptian architecture too solidly rigid to be bent freely to their purposes, they got some material and some ideas from it. The Government of Louis Philippe undertook through M. Charles Texier the examination and publication of the principal architectural remains of Asia Minor. The magnificent volumes which he brought out, and still more those published by Hittorff after his explorations in Sicily, had a great effect on French art. Architectural travellers from other countries added their contributions. I take special note of these movements in the reign of Louis Philippe, because these were the influences which prepared the changes that gave French architecture the character we have seen it assume in our day. All the new material that has been woven into it, and the freedom of treatment it has assumed under the Second Empire are the outcome of the studies undertaken under Louis Philippe, stimulated by the social and intellectual activity and the lavish patronage of the new reign.

One might fancy that architecture had gone to sleep at the Restoration, tired out with the excesses of Classicism, and when it awoke at the end of Louis Philippe's reign, it was with an entirely new feeling, and it went about its work in a new spirit. The growing feeling of romanticism, and the modern tendency to scientific inquiry and rationalism were equally opposed to the rigidity of Classic forms, and the active-minded Frenchmen of the day could not surrender themselves to the straight guidance of precedent. Nevertheless, the academic prestige was too strong to yield entirely as in England to the influence of mediævalism, and there has not been in France the same protracted war between the styles as elsewhere. The Ecole des Beaux-Arts, under the Institute, has never given up its essential control of the profession: academic precision and symmetry were and still are insisted on. It is curious to notice how all the practical doctrines of design which the mediævalists have insisted on, such as subordination of forms to uses, clear expression of purpose, characteristic and common sense use of material, were one by one acknowledged and then adopted by the French leaders, and how, notwithstanding, the academic spirit and classical feeling remain. Toward the end of Louis Philippe's reign, a number of works were undertaken which showed an entirely new manner, and made the beginning of what might almost be called a new style. Some of them, it is true, had been designed and undertaken in the early part of his reign. Their leading characteristic was a free and thoughtful adaptation of Greek forms, lines and mouldings to a careful study of modern uses and the expression of modern feelings; but the architects were somewhat eclectic: their materials were drawn not only from Greece itself, but from Lycia, Syria and Sicily, and even from the freshly-examined Romanesque of France, especially from that part of it which had been influenced by Byzantine tradition. In fact there is so much similarity of feeling for line and detail between the Greeks and French, and French prescriptive training helps this so much, that the effect of the efforts of mediævalists on the body of French architects has been to turn their attention rather to what was Byzantine or later Greek in their old architecture than to the distinctively mediæval or Gothic period. France may almost be said to have been three times colonized by the Greeks: of the first colonization by the Greek sailors before the Roman dominion at Marseilles and other Mediterranean seaports, it is too late to trace the marks perhaps, unless in the singularly classical physique, maintained distinct to this day, of the people of Arles and its neighborhood. The second colonization, so to speak, when in the Dark Ages caravans from the Byzantine Levant landed at the same seaports, and stretched their march across Toulouse and Aquitaine, had left us the Church of St. Front at Perigueux, and a thousand marks of Greek form on the architecture of all that neighborhood; marks which reappear among the varied detail, recently gathered from Greece herself and all her accessible colonies to form the style of the Second Empire, in which we may, if we will, see, as it were, a third Greek colonization in France. L.

Electric-Lights for Light-houses. — Thomas A. Edison was asked by a New York *Tribune* reporter whether the report of the English Committee on Light-houses, to the effect that electric-lights were useless in a fog, was true. "The report was half truth, for it only deals with a half subject," replied Mr. Edison. "The idea that they expressed was that gas was more valuable in a haze than electric-lights, the latter being invisible at a short distance. Such a report, if adopted by people without investigating, would give a tremendous blow to my business, but a little study will show that it applies only to one kind of electric-light. The reason why the light on which the committee based their report cannot be seen through a fog is that there are no red or yellow rays in it. The watery vapor in the air during a fog absorbs the arc-light, and renders it so useless that there might as well be no light. Some time ago I was walking through Boston Common in a haze and came suddenly upon an arc-light that was invisible a hundred feet away. The arc-light shows its lack of the red and yellow rays in various ways. For instance, put one on a high pole and while everything for a short distance around will be brilliant, the light seems to sink into the ground a short distance away. The black earth absorbs the white rays and nothing is reflected. A gas-jet in a fog appears to be blood red a short distance away, and that is the way with an incandescent electric light, excepting that the line is less pronounced. There are both red and yellow rays in the light, and a jet of the same power can be seen no farther, while all heat and smell are abolished. Then, six incandescent lights are equal to an arc, and the English Committee, as well as other people, are bound to find out that all other lights are doomed for light-houses, excepting the incandescent electric light."

BERLIN AND NEW YORK.[1] — II.



In my last letter I spoke of the recent brick structures in this city, of their general features and the nature of their decoration; but there remains something to be said regarding their brickwork specifically so called. The units resemble in shape our "regulation" brick at home, but are, if I mistake not, a little smaller in size, and I have noted no disposition to vary from this one pattern, either when passing from one structure to another, or from one to another portion of the same structure. It is impossible, I fear, to express in words the mechanical perfection with which the brickmaker has done his work; the precision of edge, the flawless, hard smoothness of surface, the rigid, absolute uniformity of tint he secures. If to be mathematically invariable in form and color is the artistic ideal in brickmaking, then indeed the Berlin artisan leads his craft. And an equally supreme mathematical exactness is attained by the bricklayer also, for his units are set and pointed off with a faultless regularity that seems hardly the work of mere human hands. If a very conscientious machine ever makes and puts up a brick wall it will look exactly as do the brick walls here. I need hardly say, however, that such are not the ideals most in favor with ourselves to-day. And in this respect at least, I think we are more "scholarly" than Berlin, if to be scholarly means to follow as closely as possible the example of the greatest building ages; but to one who has seen them both it needs no citation of authorities for or against to prove the superiority of our best recent efforts over those which are characteristic here. Such examples as Sever Hall at Cambridge, and the Lexington Avenue Warehouse, the Tiffany Mansion on Madison Avenue, and the Columbia Bank in New York, not only show a desirable variety in aim and result that is quite unmatched in Berlin, but each in itself, I think, is far more satisfactory than anything here, at least from an artistic point of view. From the practical, mechanical point of view, I cannot speak. I can see of course that nothing could promise permanence with greater emphasis than does this German work. The tooth of time — the foot of the lichen, the wash of water or the friction of dust — is not likely ever to corrode these cast-iron surfaces into decay; not likely, I sigh to think, ever to mitigate them into greater beauty. And one is fain to believe that the methods which have served so well in mediæval and Roman work might have served well enough even for the needs of a Prussian bureaucracy. At all events it is a sad offset against the evident immortality of these structures that they should convince us for the moment that nothing on earth could be uglier, more repellant, or more inartistic than the burnt clay which is so indispensable an ally. — scarcely even a wall of red iron marked off into tiny rectangles, and decorated with reliefs in the same substance: I do not think there would be a pin to choose between the two. I should explain, however, in the interests of strict accuracy, that the painful uniformity in tint at least is not so thoroughly achieved in the light shades of yellow brick as in the red which is more commonly used. But we feel sure it has been just as earnestly desired.[2]

A pretty fair comparison may be drawn between these recent Berlin buildings and the New York Produce Exchange. I do not thus select it because we at home consider it a peculiarly triumphant essay, but because it comes so near to the German work in general intention. No similar structure here is so grandiose and imposing, or (with all its minor imperfections) so harmonious and good in design and proportion. In none are the brick surfaces so pleasantly treated, and in none are such fine effects of shadow secured. I doubt, on the other hand, whether a German architect would ever use such "styleless" and reprehensible decorative motives. But even here we feel the *aim* has perhaps been better, since there has been some perceptible effort to produce a *decorative* as well as a merely ornamental result. The tower is better in itself, and not a whit more disassociated from the main mass than is the tower of the Rath Haus. And I think that even in the weakest point of the Exchange — in the want of coherence which exists between its interior and its exterior forms — it is not a greater sinner than the Rath Haus, which had in its given problem, moreover, far less excuse for sinning. At all events the Exchange produces a powerful, agreeable, individual and lasting "architectural impression;" and I cannot say as much for any analogous building here. One of my chief expectations in coming to Berlin was that I should see many things that would be suggestive as regards our own current effort to make good use of brick and of terra-cotta decoration. But no expectation I have ever

[1] Continued from No. 499, page 29.

[2] The hard uniformity of surface in these buildings is not correctly reported of by photographs: the sun seems to find out and accent diversities and gradations which escape the human eye.

cherished has been more utterly disappointed. If there are lessons to be learned it is not we who need sit as scholars.[1]

A much more ambitious essay than any of these last is the new Kunst-Gewerbe Museum, built by Herren Gropius and Schmieden. It stands free on all sides, but again we have a four-square right-lined box, relieved only by a portico which is tacked onto, not combined with, the main mass. The windows of the principal story are large and square, and divided into three lights by pilaster-mullions, after the manner dear to German architects in Renaissance times. These as well as most of the other profusely applied trimmings and the basement are of a yellowish sandstone; there is also terra-cotta decoration, and the broad spaces between the small windows of the third story are filled with pictorial panels of mosaic executed in brilliant colors on a gold ground. So the red brick which forms the body of the structure does not play a very large part in the scheme. A vast deal of money, labor and well-trained skill have been expended on the decoration, and the most complete and brilliant color-effect has been aimed at; but the result is not very inspiriting. Above the basement, for example, runs a wide frieze of figures representing the various technical and industrial processes. It shows, as do the glass mosaics beneath the cornice, the general German tendency to tell a symbolic story with child-like directness, but with little power save of a "literary" illustrative kind; little conception of what is the real meaning of the words, *monumental, decorative*, or even *plastic*. There is a pettiness of intention, a commonplaceness, so to say, of mood, a sentimentality and "sweetness" of feeling about the work which doubtless would not in the least distress one in the original drawings, but which are essentially inadequate to the necessities of monumental decoration. Again, it was not a very monumental idea to flank the entrance-steps with seated figures of Holbein and Peter Vischer, one drawing in a book, the other modelling a detail of the Sebaldus-Grab. They are correct and scholarly in design, and pleasantly naturalistic in general expression and treatment; but they should have been little statuettes, not over-life-size figures put to architectural, monumental service. The color of the great mosaic pictures is of the same sort I have noted elsewhere; bright and varied, not distinctly inharmonious and yet not harmonious as we mean the word when speaking of monumental decoration. It has no pronounced key-note upon which all else depends, nor does it blend in a distant view into any pleasantness of tone. And the same may be said of the general color-effect of the building. There is no dominant note; for the brick has been too much suppressed by the ornament to afford this; and no rythmical balance of tones. Coloristically and in design the structure is an aggregate of parts, more or less interesting in themselves, but bound together by no vital cohesion, and certainly worked out of nothing that could be called an architectural idea. Such a piece of simple structural design, as I will say, that side of the Boston Medical School which faces toward Trinity Church, hasmore architectural value than all this ambitious costly overlay which there has been no conception, no *architecture* in fact to guide and unify.

When we enter the Museum we find it is composed of four wings surrounding a great glass-roofed court, which is encircled on the ground floor, and again above by arcaded galleries giving access to the exhibition rooms. The construction is not in any way remarkable for beauty. The decoration, a little too pronounced and heavily rich, interferes a little with the effect of the collections themselves. And we are as surprised as shocked when, in a structure dedicated to the growth of good taste in art and industry, we see that the superficial sumptuousness of effect has sometimes been wrought by the aid of shams; by marble which is paint, and by gilded bronze which is not metal at all. One element of the interior decoration, however, is very charming, and charming in the way that might least have been predicted. A frieze of figures which runs beneath the great glass roof, strikes me as the best essay in polychromatic sculpture I have anywhere seen. It is quite effective enough as decoration, yet very tenderly harmonious in a rather pale scheme of color. I doubt, however, whether any human being will ever look beyond its general agreeableness of effect, will ever stop to trace out in detail the myriad symbolic intentions of its endless groups and figures; intentions the mere main points of which fill two pages of explanation in the catalogue.

One wonders whether it was the evident — and, indeed, generally acknowledged — failure of this building as a whole which led the powers that be to make a new and near neighbor so very different. I am sorry I cannot name the architect of this (the still incomplete Ethnological Museum) for it seems to me one of the three or four best things in all Berlin. It is of a light gray granite, very delightful in tone, and a very refreshing contrast to the ubiquitous pale yellow of sandstone and stucco, and the hard red of the new brick, as well as to such a parti-colored mass as the Kunst-Gewerbe Museum. The style is a stern Roman Renaissance with an applied Doric order of majestic proportions below, and a Composite one above, and no further decoration. Here we do see at last an attempt at structural composition. The building holds a corner site, and at the angle is a great semi-circular pavilion which is brought farther forward than the line of the wings, but at its base retreats somewhat beyond their face.

Still more successful — indeed I think extremely successful and extremely interesting — is the new Technological Institute in the suburb of Charlottenburg just beyond the Thier-Garten, an enormous structure of stone, the chief front of which measures two hundred and thirty metres. The side wings project so as to form two great corner pavilions behind which the main portion of the front is considerably withdrawn, being itself broken by a central pavilion of much shallower but still effective salience. A rather rapid rise in the ground has been utilized to form a fine approach to this — a wide flight of steps encircled by a driveway which leads over their platform. Only in the central pavilion is there any pronounced recourse to that columnar style which is so generally favored here, and this seems to me the least successful part of the composition — not very agreeable in its proportions (the attic being unduly heavy) and overladen in its rich profusion of shafts and statues. Elsewhere the design has been suggested by earlier and simpler Italian Renaissance examples. The main stretches of the façade show, above a lofty, very solid basement with rectangular openings, two ranges of round-arched windows, and a third where the windows are of similar shape but being small and closely set, and having delicate little applied columns between, produce the effect of a graceful arcade. In the corner pavilions the treatment of the basement is the same, but the upper stories are differently designed, and in a way which gives a welcome accent of strength and solidity; their windows being grouped in the centre, and the broad wall-spaces on either hand being enlivened but not unduly disturbed by niches with statuary. Add to this that the proportioning between the stories is very happy (except as I have said, in the central pavilion), that the cornice is strong, and is crowned with a light but rich balustrade, and that the string-courses are well marked, and show clear and charming profiles at the angles of the structure, and it may be understood that there has been here a great divergence from the general local level in design. I am sorry that no photograph of the building can yet be had; but after all, an illustration would not reproduce its chief beauty, its most individual characteristic — its color treatment. This is, I think, the most delightful essay in "natural polychromy" I have ever seen from a modern hand. Of course there may be others as good which I have *not* seen, but I doubt whether any of them can be better. The lofty basement is of a red sandstone, similar in color, if I remember rightly, to the Longmeadow stone of Boston but lighter in tone. The story next in order is of a rather pronounced yellow sandstone, the "value" of which is in the best accord with that of the red below. And the two upper stories with the balustrade are of a gray granite so pale as to be almost white. The proportioning of these masses of different color seems to me very happy, and their harmony has been brought into greater unity by the artistic device of carrying up into the white a reminiscence of stronger tones. In the spandrels of the third story, disks of red and green marble have been introduced, and the little columns of the uppermost, arcaded story are red again. The scale of the building is so great that such a pronounced variety of color produces no unquietness of effect, and the result is as fine in its monumental grandeur as it is individual and brilliant. It is a pity so good a structure does not stand in the centre of the town, instead of amid rather shabby surroundings in a suburb. As we were provided with no permit we were unable, unfortunately, to see the interior, which from the evidence of the exterior may well be worthy of examination. The designs for the work came from the veteran hands of Lucæ and Hitzig, but I do not know whether the color treatment should be credited to them or to Professor Raschdorff who was intrusted with the carrying out of their intentions.

If this building is a genuine and imposing architectural conception — and, therefore, an exception in Berlin — so too, though in a totally different way, is the railway-station for the Anhalt line, erected a few years ago by Herr Schwechten, and widely and deservedly known to fame. Though in one way not, of course, the more beautiful of the two it is perhaps the stronger and more interesting in its entire independence of time-honored models, and the more instructive in its excellent resolution of one of the most frequent and trying problems of to-day.

It is unfortunate, again, that no photograph can be had which gives any idea of its best qualities; none, that is, of its interior. The exterior front shows, above a porch and waiting-rooms of no particular originality, a group of slender round-headed lights embraced beneath a great slightly elliptical arch which shows the form of the glass-and-iron roof of the terminus proper; but when we have passed through the waiting-rooms and up a stairway into this terminus, we see that the externally visible forms serve the laudable purpose of expression only; the roof is actually supported by a similar group of unglazed lights, which is united with the external group over the roof of the inner waiting-room, by flying-buttresses. And a corresponding design, supported by a huge arch beneath, forms the opposite end where the tracks emerge from under shelter. The scale is so enormous, the design so happy in its proportions, and so strong, massive and effective in its treatment, that the impression produced is of the grandest sort; and grand in a way which is perfectly suited to the utilitarian purposes of the structure and the repose of its material, and perfectly expressive in its functions as supporting the vast roof above. The main range of large round-arched windows on the long sides of the terminus show, again, very fine proportions, and the glass employed is of a pleasant pale-green hue. The only fault one can find is that the substructure here does not seem solid enough with its line of close-placed doors and windows. The brick which is employed, both outside and in, is of a good light yellow color, not so

[1] I may add that I have remarked no attempt whatever to use carved brick in decoration.

uniform in tint or so hard in tone as is the rule in Berlin. But the ornamental details are still too small and finnikin and too profusely used. Such monumental forms might well have been left to play their part without the aid — or, more truly, the hindrance — of petty, pretty little decorations, which in scale and in motive are out of character with the nature of the building.

The roof of this terminus, is, I believe, exceeded in span but by two others in the world. More, I am too ignorant to say of it, save that to an uninstructed eye it looks unusually light and simple, unusually inobstructive in every way.

As is well known, ten years of discussions, disputes and competitions have finally been ended by the selection of a design for a new Parliament Building. Ground has been broken for it in an excellent situation beside the Thier Garten and just beyond the Brandenburg Gate. But the plans are no longer on exhibition, and I have been unable to learn their character. I am sorry to say, too, that the projects for the new Kaiser Wilhelm Strasse have also just been withdrawn from public inspection. This street is to continue the Unter den Linden on the other side of the Spree, running through one of the older quarters of the town where such a thoroughfare is sadly needed. The Marien Kirche which is one of the very few really ancient structures in the city will, I hear, be brought into fuller view than heretofore; but such other good results as may be attained must be left for some future tourist's chronicle.

My own rambling chronicle has indeed been quite as superficial as I promised. It would take much more time and much better facilities than I have had at command — not to speak of much profounder knowledge — to enable one to give a really complete picture, a really authoritative judgment, of modern architecture in so huge a town as this. But from what I have endeavored to appraise, that is, the general aspect of the most frequented quarters, and the general character of their most conspicuous and ambitious structures, the conclusion has forced itself upon me that the usual route of the travelling American student need by no means yet be altered so as to embrace Berlin. For, so far as I can guess, that which such a student chiefly seeks in modern work is the realization of new architectural ideas; not, of course, ideas which are new as being composed of novel elements, but new as adapting whatever elements are chosen to a thorough satisfaction of the novel requirements of to-day, and to a distinct expression of contemporary life on its practical and (if it has any) on its artistic side. And such architectural ideas seem to me very rare in Berlin; rare even as compared with the degree to which they prevail in other lands. Here, least of anywhere, where new needs are infinite, where money is lavishly spent, and where ambition is very lofty, does there seem any strong desire to wrestle with the fundamental problems of the art, to study a structure from the inside out, to think first of its *plan*, and next of how this may truthfully be expressed in its exterior; to make, in a word, the character and purpose of a building the *raison d'être* of its general effect, of its every feature, and of its entire decoration. I think we find a strong proof of this in the mere fact that in such a climate the roof is so entirely suppressed; a strong proof that structural composition is not rated at its due value either as the foundation of expression, or as the foundation of beauty either. Goethe once told his countrymen that they had "*no plastic power*," and I think he would not have reconsidered his dictum in Berlin to-day. The Anhalt Bahnhof is indeed one palpable exception to the rule (except with regard to its decoration), and I do not question that there may exist other exceptions in every department. But opposite examples are so conspicuous in their numbers, and so pronounced in their character that they indisputably *make* the rule. Hand in hand with all this goes what I may call the general *uninterestingness* of Berlin building both good and mediocre. This is a difficult quality to explain in words, though not a difficult one to recognize in fact. Perhaps I may say that I mean it as the quality which impresses one with the idea that knowledge, training, conscientious effort and conventional good taste may or may not have been brought in play, but that whether they have or not (and even though they *have* to a very eminent degree), such other factors have been lacking as freshness and vitality of mood, strength and individuality of feeling, fervor and genuineness of impulse on the artist's part; spontaneous architectural *imagination*, spontaneous artistic *instinct*. These are big words to use, I know. Spontaneity and vitality are nowhere common to-day; certainly not as combined with that scholarly skill and that sure judgment which alone really bring their results within the pale of *art*. But here more than in any other place I can recall where there has been any approach to so vast, so varied and so ambitious an activity, they seem to be conspicuously lacking. Here more than anywhere else does modern architecture seem not an ignorant, a careless nor an unexperimenting, but yet a cold, a labored and an unvital art, an art which is uninspired by any touch of imagination, enthusiasm, creative instinct; by any touch of that breathing, quickening, *human* quality which in every art (and whether the result in question be wholly successful or almost wholly unsuccessful, even) marks the difference between the interesting and the uninteresting, the difference, that is to say, between the created and the manufactured, the living and the dead. M. G. van Rensselaer.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

PULPIT ON THE FRONT OF THE CATHEDRAL, PRATO, ITALY.

PRATO is a small town eleven miles northwest of Florence. It formerly belonged to Florence, and during the early Renaissance period was quite actively engaged in artistic work, attracting to itself several of the best Florentine masters, who have left a number of very interesting monuments in the style of the period. The Cathedral dates from the twelfth century, though finally completed by Giovanni Pisano two centuries later. It is in much the same style as the Pisa and Siena cathedrals, though falling far short of both in design. The façade, decorated in bands of colored marbles, dates from 1450. On one corner is the pulpit shown in the photo-print. It was designed conjointly by Michelozzo and Donatello, the latter of whom carved the exquisite bas-reliefs of dancing children. It is from this pulpit that the highly revered *sacra cintola*, or girdle of the Virgin, is exhibited for the comfort of the faithful. This girdle is said to be the identical band which the Virgin let down from heaven to convince the doubting Thomas. Over the principal entrance of the Cathedral is a large group by Andrea della Robbia, the Madonna with SS. Stephen and Lawrence. Inside there are some fine mural paintings by Agnolo Gaddi; frescoes by Fra Filippo Lippi, the finest work of this master; a handsome bronze screen, and a number of other art works, including a good round pulpit by Mino da Fiesole.

THE ANHALT RAILROAD STATION, BERLIN, GERMANY.

For description see the article on "Berlin and New York" elsewhere in this issue.

HOUSE FOR BERNARD KARZ, ESQ., PATERSON, N. J. MR. CHARLES EDWARDS, ARCHITECT, PATERSON, N. J.

SOME DOORWAYS IN AND ABOUT BOSTON.

SOUTH PORCH OF THE CATHEDRAL OF NOTRE DAME, ROUEN, FRANCE.[1]

THE JEFFERSON MARKET (THIRD DISTRICT) COURT-HOUSE, NEW YORK, N. Y. MR. F. C. WITHERS, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print, issued only with the Gelatine Edition.]

A plan and description of this, which was voted one of the "best ten buildings" in this country, may be found in the *American Architect* for June 15, 1878.

SOME NEW JOURNALS.

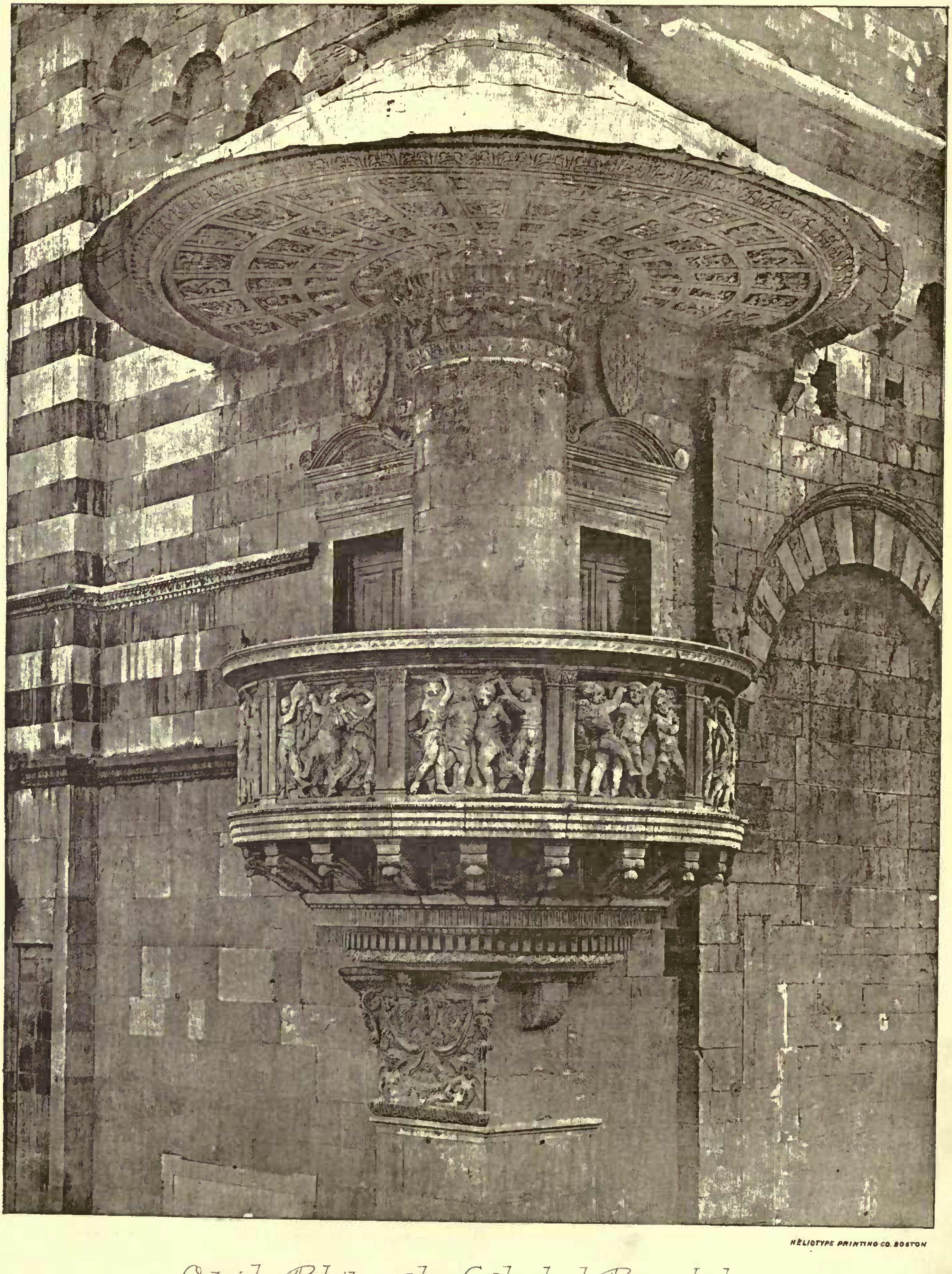


Lion's Head, Grecian Sculpt. Temple at Metaponti.

BEFORE speaking of what we believe is the latest venture in art journalism, we have waited for several issues to appear in order to discover whether what promised to be a very welcome visitor seemed likely to fulfil its early promise. It seems like a hardy enterprise in these days to start a new journal of any kind when the field appears to be already crowded, but still they come, and it is surprising how many succeed in staying, and in this the monthly journal seems to have a much greater success than the weekly ones, or, again, than the daily newspapers, which seem to die as soon as they are born. We believe that this journal[2] will have little difficulty in maintaining a foothold, but whether it will do more than this will depend on many circumstances, some of which are within the control of its editor, and others are not. At present it is a journal whose interest lies wholly in its illustrations, which are admirably presented and are selected from various "sources" with much good judgment; and there is good reason to believe that the editor, as he becomes wonted to his work, will find it more and more easy to provide acceptable material if he escape on the one hand the error which brought disaster upon the, in many ways, attractive publication which Mr. Rinn undertook some years ago, and which makes the English journal *Decoration* so wearisome to those who see it; and if on the other hand he can avoid the fate which he seemingly invites, of becoming the exponent — exclusively — of those who disregard the "traditions and rules of their masters in the art." The efforts of the clever ones of the "new schools" are attractive and entertaining while they are fresh, but after a while they are as productive of æsthetic indigestion as would be the slight annual changes that a woman, once pretty, could make in the extravagantly fantastic head-dress that momentarily pleased the fancy of the lover of her younger days. As most of the illustrations of these early numbers are not the work of this inspired school we are spared that phantasmagoria of art which the editorial announcement seems to presage for the future.

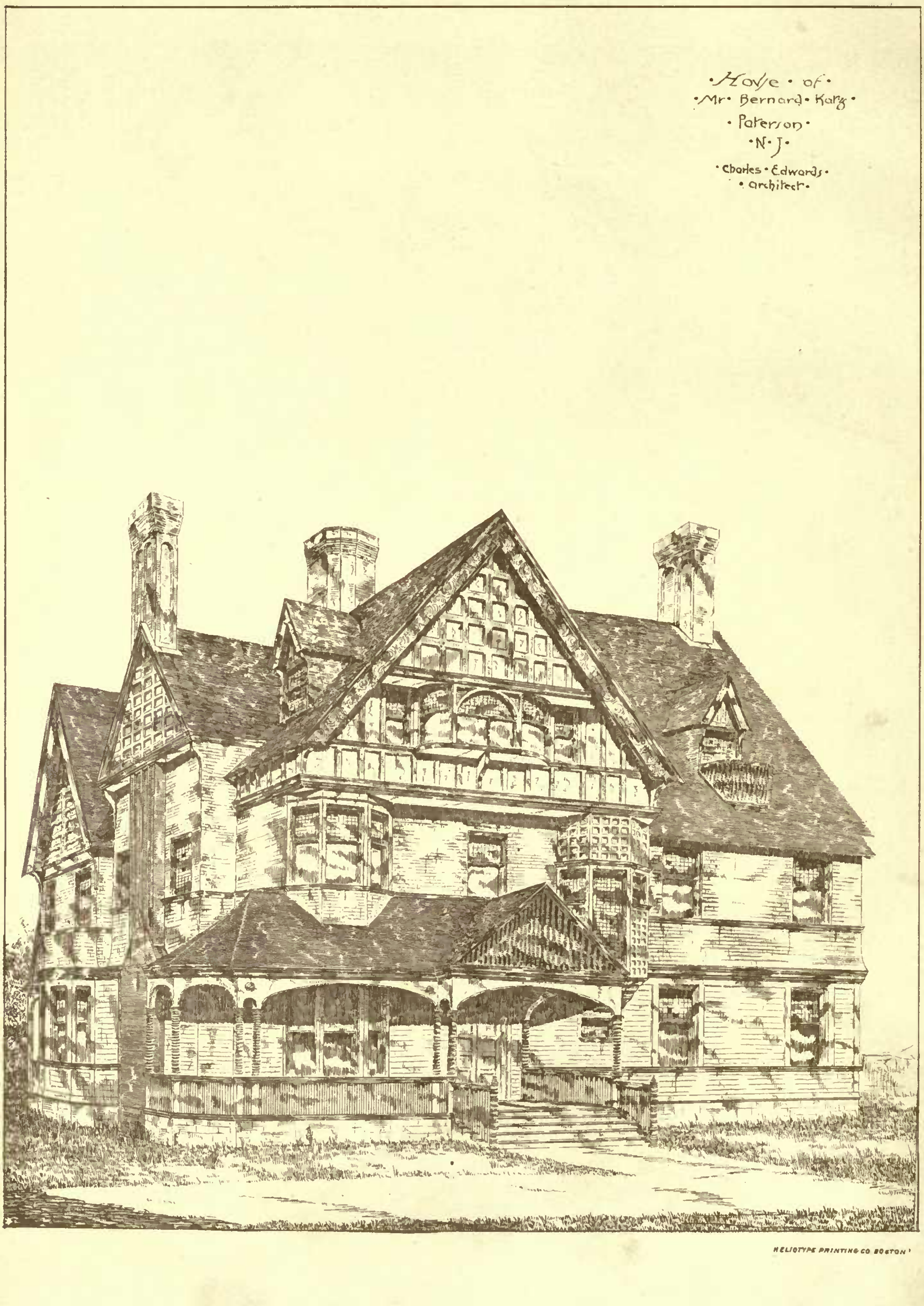
[1] From Cotman's "*Antiquities of Normandy.*"

[2] *Art and Decoration.* An illustrated monthly devoted to Interior and Exterior Ornament under the Art Management of George R. Holm and the Editorial Conduct of Caryl Coleman. New York: 1885.



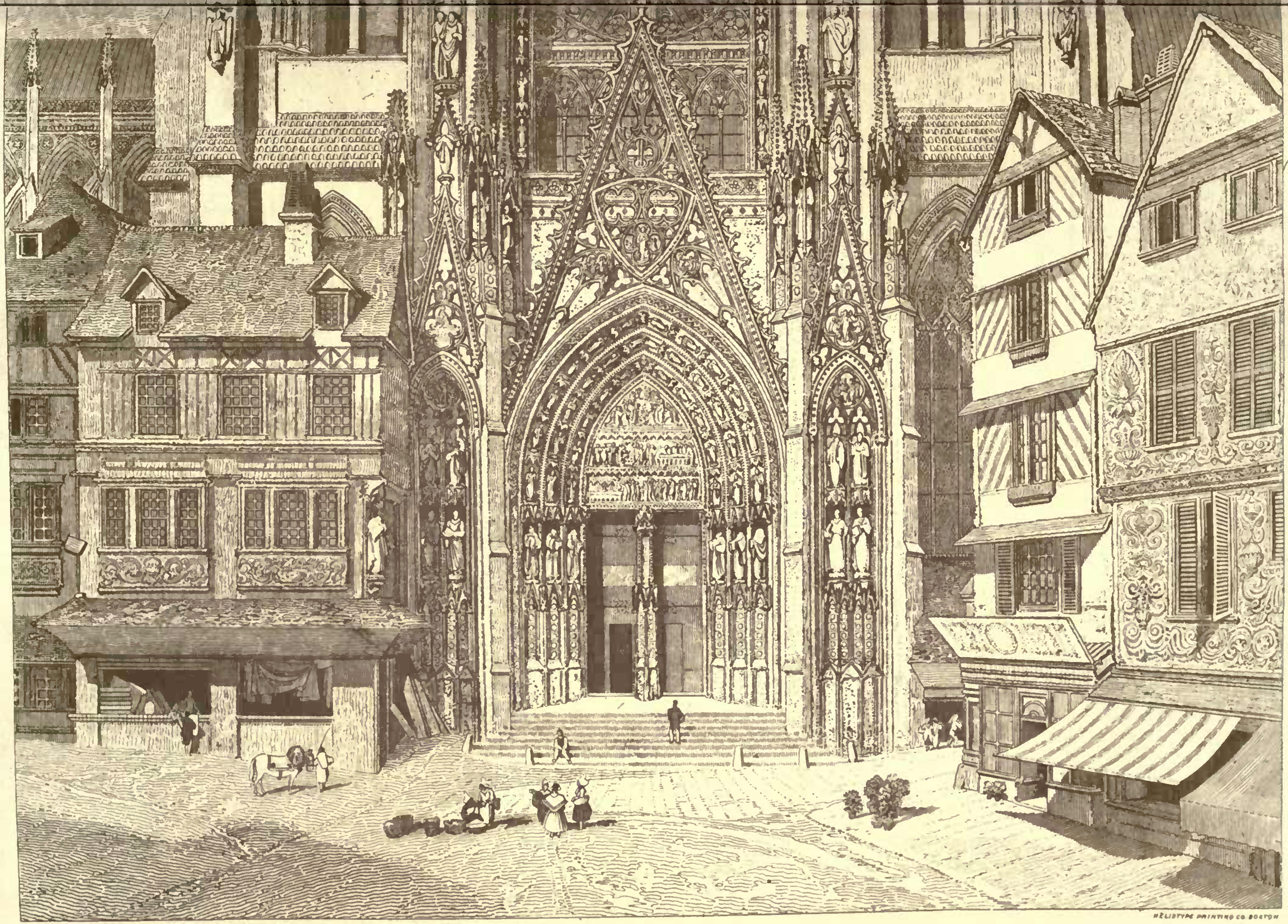
HELIOTYPE PRINTING CO. BOSTON

Outside Pulpit on the Cathedral, Prato, Italy.

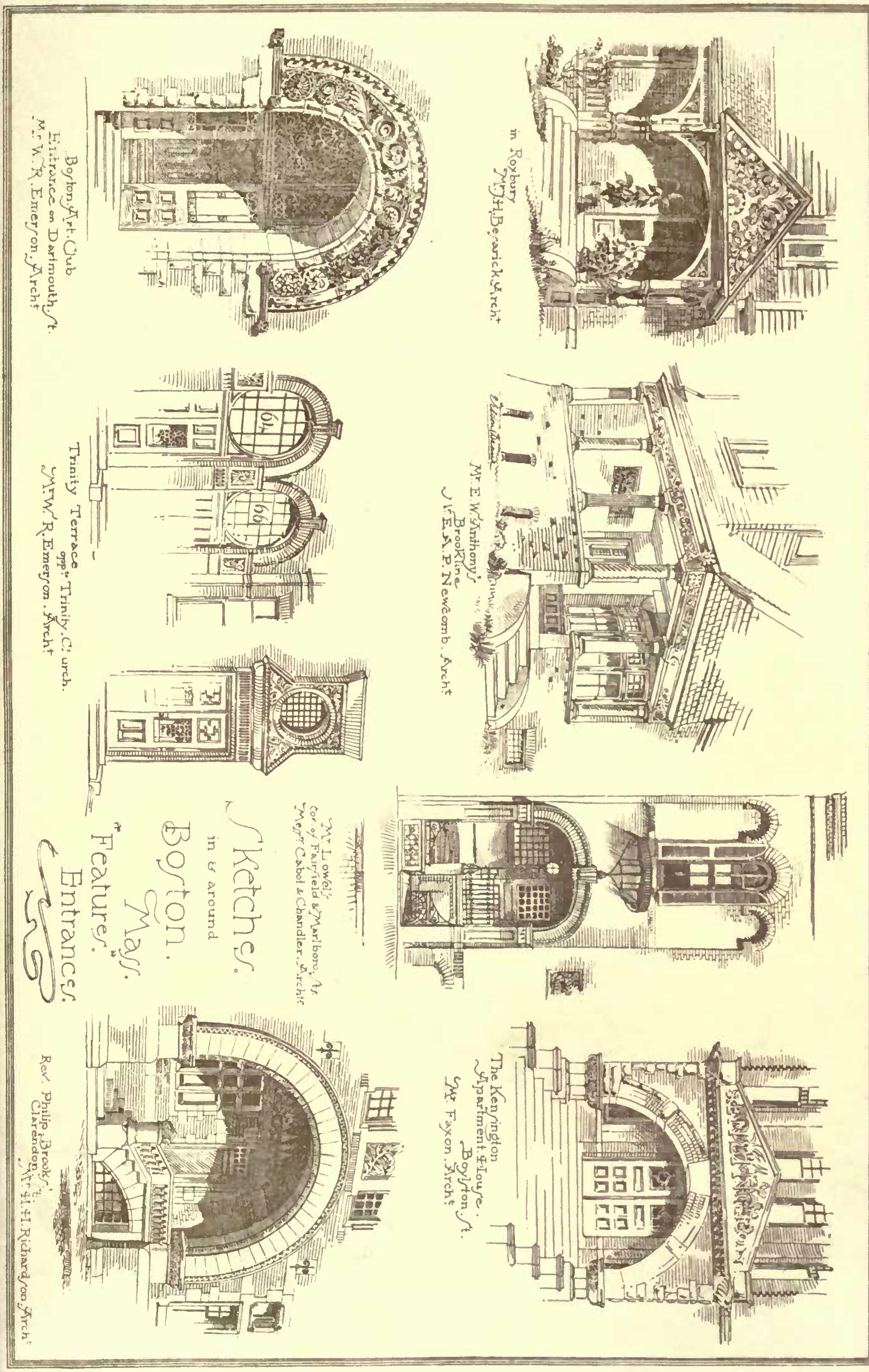


HELIOTYPE PRINTING CO. BOSTON

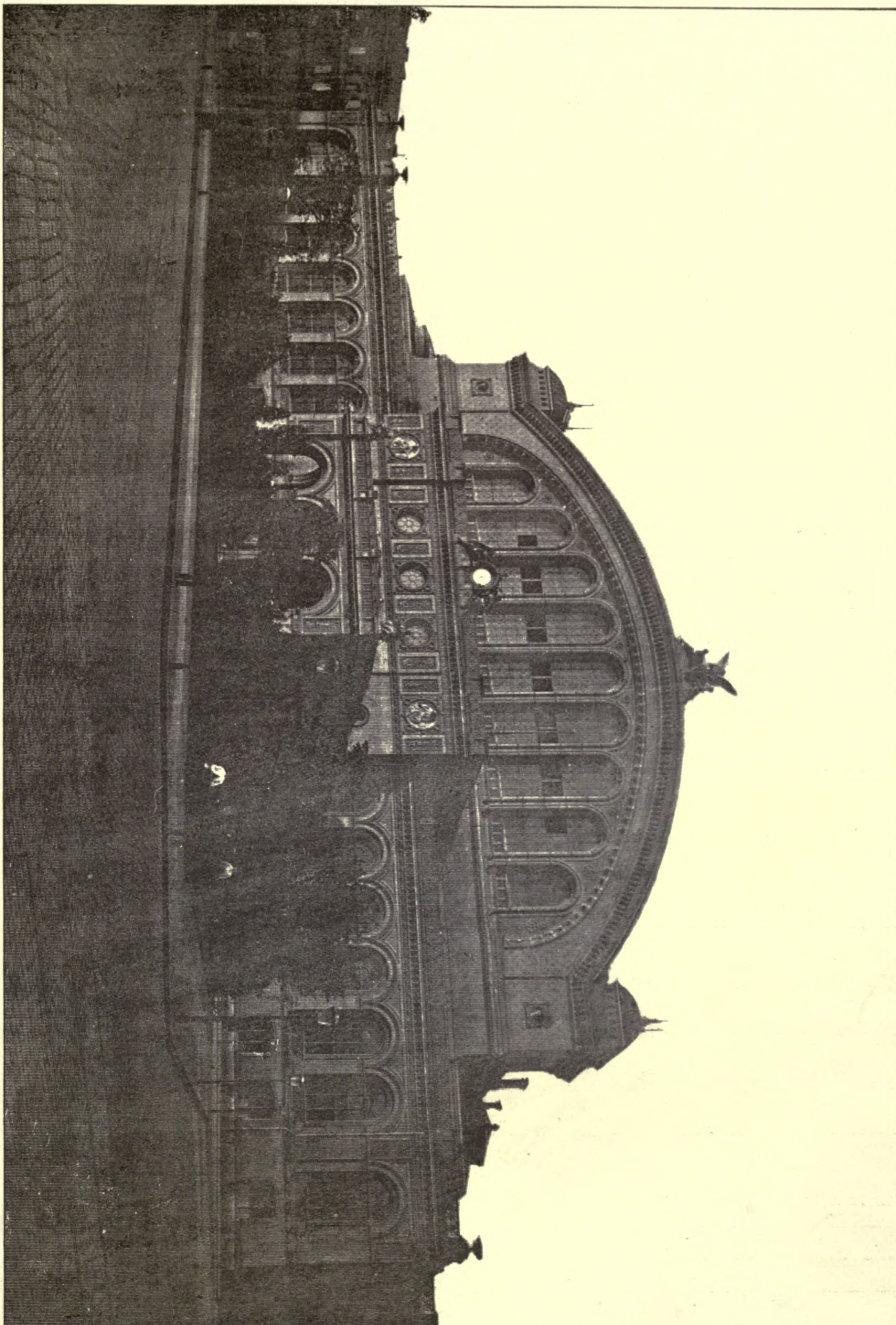




CATHEDRAL CHURCH OF NOTRE DAME, AT ROUEN.


in Roxbury
Mr J. H. Besarick, Archt
Boston Art Club
Entrance on Dartmouth St.
Mr W. R. Emerson, Archt
Mr E. W. Anthony's
Brookline
Mr E. A. P. Newcomb. Archt
64
66
Trinity Terrace
opp. Trinity Church.
Mr W. R. Emerson. Archt
Mr Lowell's
Cor. of Fairfield & Marlboro St.
Messrs Cabot & Chandler. Archts
Sketches
in & around
Boston.
Mass.
"Features"
Entrances.
The Kensington
Apartment House.
Boylston St.
Mr Faxon. Archt
Rev. Philip Brooks'
Clarendon St.
Mr H. H. Richardson, Archt

AMERICAN ARCHITECT AND BUILDING NEWS, JULY 25 1885 No. 500



HELIOTYPE PRINTING CO. BOSTON.

The Anhalt Railway Station, Berlin, Germany.

Blowing one's own trumpet is sometimes the only way of making a stir in the world, but this journal could easily have got along without so ill-advised a statement as that "our journal is the only art paper published in America receiving a large support from the young draughtsmen and architectural students." Such vainglorious boasting sounds, in the slang of the street, "too fresh."

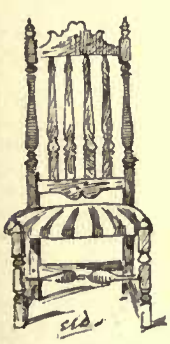
Another journal[1] may have felt that we have been extremely dilatory in paying it the usual attention, but the fact is that as the first issue was issued with the unusual statement that it was a "precursory number," and so seemed to be put forth only as a feeler, we did not feel at all sure that it would have any successors, and their appearance amongst the mass of unopened "second class" matter on our tables escaped notice.

Here again the unexpected happens — a second journal appears soon after its predecessor has become fairly established, being inspired seemingly by the ineradicable human belief that where there is room for one there is for two. And yet the style and scope of the two journals are so different they may each successfully satisfy their "want." There is an indefinable something about this journal which makes one wonder why its editor does not give it the old-fashioned form of a quarterly review, which seems to offer a chance for playing a rôle which we believe has not been undertaken as yet. But from its evidently having been undertaken to promote in some degree the interests of the exhibitors at the Permanent Exhibit of Building Materials we suppose there is as usual a background of expected money-making through exploiting the wares of advertisers, who would be but ill-served by a quarterly publication. The distinctive feature is a plate showing two foreign subjects printed by an American photo-gravure process which falls far short of those excellencies which Goupil has educated us to associate with prints reproduced by this process.

Still another journal, of age too immature at the time to find a place in the Institute's "*Report on American Architectural Journals*," needs an introduction to our readers, though it will be obviously impossible for them to remember more than a fraction of its very comprehensive but cumbersome title;[2] but we will make the introduction before its proprietors add a new joint to it, a step which may be demanded by the new department which is to be incorporated in the journal henceforth — a department devoted to the "noteworthy monuments and mausoleums in our neighboring cemeteries." The issue before us contains two or three small sketches of local buildings, two or three portraits of local political officials, and a design for an equestrian monument to General Grant, in which the editors hope to create sufficient interest to ensure the contribution of the necessary funds. We trust that the enterprise may be successful and redound to the credit of our contemporary, but we also entertain the hope that when the sculptor actually begins work he will carefully determine the exact amount of "condition powder" that will secure the just amount of equine contortion that public taste demands: it seems useless to wantonly give too heavy a dose. The balance of the paper is filled with the usual complement of local notes connected with the several interests with which it concerns itself.

DECISIONS RELATING TO FIRE INSURANCE.[3]

PROBABLE AND IMPROBABLE RESULTS OF NEGLIGENCE.



Old.English.Chair

THE respondents brought this action against the defendant company to recover the value of certain personal property and of a dwelling-house situated in the city of Green Bay, which was destroyed by fire in September, 1880. The insurance company is a party plaintiff because it had insured the house and paid the insurance thereon, and in consideration of such payment Adkins had assigned to the insurance company his claim against the defendant company for the value of the house destroyed. The plaintiffs claim the right to recover upon facts set out in the complaint, showing that the property was burned by the carelessness of the persons in charge of one of the steamboats of the defendant company, whilst navigating the Fox River in the city of Green Bay. The negligence consisted in not having a spark-arrester attached to a steamboat of the company, in consequence of which sparks set fire to property on the shore, destroying, among others, the dwelling-house of Adkins. The evidence tended to show that the sparks emitted from the smoke-stack of said vessel were carried to the shore and kindled a fire in some shavings lying near a planing-mill, and thence to the mill, which was burned, as well as many other buildings, and from the sparks and brands of this burning district a second district was fired, some thirty-five hundred feet distant from the planing-mill, burning thirty-seven houses, Adkins' house being among them and the first to burn. On appeal it was

HELD — That the question of defendant's liability is one of fact for the jury, and not of law for the court. The question whether a result may or may not be expected to follow certain acts is material upon the question of negligence; that a person is not required to use that degree of care against an improbable result which he would be bound to exercise against a probable one. The defendant had the right to have submitted to the jury the question whether the result, which is the ground of action, might under the circumstances have been reasonably expected, not by defendant, but by a man of ordinary intelligence and prudence. Judgment reversed and remanded for a new trial.

Supreme Court of Wisconsin. — *Adkins and Phœnix Insurance Company* vs. *The Goodrich Steamboat Company.*

NO LIABILITY WHERE FIRE IS THE RESULT OF AN EXPLOSION.

This was a suit on a policy of insurance for the destruction of an insured building. The policy sued on contained a clause under which the insurer was not responsible for losses occasioned by explosion. The defence set up by the company in this case was that the loss was due to that cause alone, and refused payment. The evidence showed that by the explosion of the sugar-house boilers the building caught fire, which fire was apparently extinguished, but it broke out a second and a third time, within forty-eight hours after the explosion.

HELD — The existence of a fire as an effect of an explosion must be presumed to have continued as such an effect unless the contrary be proven. The insurer was released from liability for the destruction of the building.

Supreme Court of Louisiana. — *Janneret* vs. *Insurance Company.*

INCREASED RISK VOIDS THE POLICY.

A fire policy provided that if the premises should be occupied or used so as to increase the risk it should be void; and in the same clause the use of naphtha was prohibited, but in another clause it was stated that "the assured has permission to use naphtha in his business, but fire or lights are not permitted in the building, except a small stove in the office." In a suit on the policy, it was shown that some time after the policy was issued an eighteen-inch cylinder stove was placed and used in the finishing-room in the building, in which there was usually or frequently a large quantity of inflammable naphtha used. On this evidence the company defeated the action, and the plaintiff carried the case to the Supreme Court, where the company again prevailed.

HELD — No argument is required to show that this use of the building increased the risk, and the policy was thereby avoided.

Supreme Court of Connecticut — *Daniels* vs. *Equitable Fire Insurance Company.*

NON-OCCUPANCY VITIATES THE POLICY.

This was a suit by plaintiff to recover the insurance on a dwelling-house burned in April, 1881. Among the conditions in the policy issued by the company on this risk was one that the policy should become void "if the insured premises shall at any time be occupied or used so as to increase the risk, or become vacant or unoccupied, and so remain without notice to and consent of the company in writing." The house was vacant from January 1, 1881, and it was shown in evidence that the company had not been notified. At the trial of the court below, by direction of the court, a verdict for the defendant was returned, and the plaintiff thereupon alleged exceptions and took an appeal.

HELD — That the uncontradicted evidence at the trial showed that the house was vacant and unoccupied at and before the time of the fire, and therefore the policy was null and void.

Supreme Court of Massachusetts. — *Litch* vs. *North British, etc., Insurance Company.*

IN COURSE OF CONSTRUCTION AND OCCUPANCY.

This suit was brought against the defendant company to recover on a policy of fire insurance placed upon a building in course of erection. The application was made to B., an authorized agent of the company, for insurance upon a building in course of construction as a hotel; but the application stated that the building was occupied as a hotel, when in fact it was not occupied at all, but probably would have been before or soon after the issue of the policy. The application was accepted and a policy issued in accordance with the application, and the building was burned before it was completed. In the policy was a provisional clause stating that any misrepresentations or erroneous statements of the application which would affect the risk would render the policy void. On appeal, the court

HELD — That the company was bound by the acts of the agent, and his knowledge that the building was not completed was the knowledge of the company, and it was liable for the loss. That the issuing of the policy and receiving the premium by the company was a waiver of all violations of conditions of the policy, and it is thereby stopped from setting up such violation as a defense to this action.

Supreme Court of Iowa. — *Jordan* vs. *State Insurance Company.*

[1] *The Building Budget.* A Journal of Architecture and Kindred Arts. Issued from the office of the Permanent Exhibit and Exchange of Building Materials and Improvements. Chicago: 1885.

[2] *The Buffalo Builder and Real Estate Owner and Local Weekly Insurance Record.* 55 Chapin Block, Buffalo, N. Y.

[3] From "*The Insurance Year-Book,*" 1885-6. Published by the *Spectator* Co., New York and Chicago.

CHANGE IN TITLE OF PROPERTY FORFEITS THE POLICY.

Edward Malley, merchant, of New Haven, insured his property, a condition of the policy being that if the property was sold or transferred, or any change took place in title or possession, the policy should be void. He subsequently admitted William Neely to partnership, and the firm became known as Edward Malley & Co. Neely was to have furnished ten thousand dollars capital to the firm within the first year, which was not done, and the plaintiff held that the partnership had not been completed in consequence. The store and property insured were destroyed by fire and defendant refused payment.

Held — The terms of the agreement entered into between Malley and Neely constituted the latter a partner, regardless of the payment of the ten thousand dollars, and the new firm entered into possession of the partnership property which was destroyed. This constituted such a change of interest as forfeited the policy.

Supreme Court of Connecticut. — *Edward Malley* vs. *Atlantic Fire and Marine Insurance Company.*

WARRANTY BY DESCRIPTION AND DIAGRAM.

The insurance on a planing-mill was procured by a broker who used a written application made several years before to another company, which contained also a diagram showing a ground plan of the mill and adjacent buildings. The agent made a synopsis of this application, annexing a copy of the diagram and a description of the property. This synopsis was used by the agent's companies as a basis for their policies.

Held — That the diagram purported to show only the location of the buildings represented on it, and there was no misrepresentation or breach of warranty in the existence of facts which it failed to show, when the insured was only required to show the facts so far as they were material to the risk, although it also covenanted to be a full and just exposition of all the facts, unless the omitted facts were material. A representation that there was no planing-machine on the premises is not falsified by the existence of such a machine in an adjoining building not included in the policy. When a question in the application is not answered, a failure to inquire further is a waiver of answer by the insurer. The original application represented that there was no mortgage, but a mortgage had subsequently been given. The misrepresentation voided those policies issued on the basis of this application, where there had been no waiver. The knowledge of the agent of certain of the companies concerning the mortgage was a waiver of the misrepresentation.

U. S. Circuit Court, Northern District of New York.—*Mulville* vs. *Adams.*

MISDESCRIPTION OF PROPERTY VOIDS THE POLICY.

This action by the appellant was defended by the appellee company on the ground of misdescription of the building by the applicant in his application for insurance thereon. The facts as shown by the evidence were that the property to be insured was mentioned as a "story and a half-story, hard finished" boarding-house building; "that the lower story only was hard finished, and the half-story above was finished by what is known as cloth finish." On appeal it was

Held — That this was a misrepresentation of a material fact which voided the insurance.

Court of Appeals, New York. —*Jackson* vs. *Fire and Marine Insurance Company.*

NON-OCCUPANCY VOIDS THE POLICY.

This was an action by George Wells against defendant company on a policy of insurance against loss by fire, to recover five hundred dollars, the amount of risk taken on a certain dwelling-house of the plaintiff, which was wholly destroyed by fire, during the period for which the policy was written. At the time the policy was written the dwelling therein described was occupied by a tenant, under a lease for one year beginning on March 1, 1880. On October 5, 1880, said tenant with his family removed from the dwelling-house, taking away his goods, etc., without any intention of returning, leaving in the house a barrel containing some bran and a coal-oil can. During the same night the house was burned. The owner was ignorant of the fact that the tenant had left the house. The policy attached to the petition in the case contains a condition that the policy shall be void "if the building herein mentioned be vacant or left unoccupied." The defendant company alleged that "at the time said house was burned, and for some time prior thereto, it was left, and without the knowledge or consent of the defendant company, wholly vacant and unoccupied." To this answer plaintiff entered a denial. Among his contentions was one that the presence of the barrel and can left in the house constituted continued occupancy. The verdict and judgment were rendered for the plaintiff, which judgment on petition in error was affirmed by the district court. On appeal to the Supreme Court it was

Held — That an absolute condition in a fire insurance policy on a dwelling-house, that the policy shall be void "if the building insured be vacated or left unoccupied," voids the policy, although the vacation of the house resulted from the permanent removal of the tenant of the insured during the running of his lease, without the knowledge or consent of the landlord. Also that the building was insured as an occupied dwelling-house; that the parties to the contract were competent to make a stipulation that said building was to continue to be occupied; that the leaving behind the barrel of bran and oil-can did not prevent the avoidance of the policy; that the house had ceased to be occupied as a dwelling, and that the length of time elapsing after the vacation and before the fire is wholly immaterial. Judgment reversed and cause dismissed.

Supreme Court of Ohio. — *Farmers' Insurance Company, Appellant* vs. *Wells, Appellee.*

ATMOSPHERIC HUMIDITY.[1]



SCIMITAR TOOTHED LION

THERE is yet another gaseous element of the atmosphere which is absolutely universal, although the amount which is present varies immensely under different conditions. This is watery vapor.

Although this vapor is invisible, we are constantly being reminded of its presence. The moisture that condenses on the cool window-panes of a crowded room, or that dims the surface of the tumbler of iced water which one may be lucky enough to get at some suffocative dinner, are among the every-day evidences that watery vapor is present in the air, and ready to condense.

Air is only capable of keeping a certain definite amount of watery vapor in an invisible condition. For equal barometric pressures the amount varies with the temperature. The higher the temperature, the greater is the amount of vapor which the air will hold invisible. At a freezing temperature each cubic foot of air will hold just over two grains of watery vapor, while at a temperature of 100° Fahr. the amount which the air will retain is close upon twenty grains, or ten times as much. These figures are not precisely accurate, but they are near enough for our purpose, and are easily remembered. When the air contains its maximum amount of watery vapor (an amount which increases with the temperature) it is said to be saturated, and if saturated air be cooled the moisture is deposited in the form of dew.

Rain, in like manner, is caused by the cooling of air saturated with moisture.

According as the moisture in the air falls short of saturation, so is its drying power, and its power of causing the evaporation of fluids. If complete saturation be spoken of as 100°, then the relative humidity of the air may be stated as a percentage of the maximum. Let us suppose that a cubic foot of air contains 50 per cent of watery vapor. If the temperature of the air be 32° Fahr., then we shall know that each cubic foot (containing fifty per cent of its maximum) holds about one grain of watery vapor, and is capable of drying up a second grain. If the temperature of the air, however, be 100° Fahr., we shall know that each cubic foot (containing 50 per cent of its maximum) holds about ten grains, and that the drying power of each cubic foot is equal to another ten.

Now it is important to bear in mind that although the air in both these imagined instances has a humidity of 50 per cent, yet the drying power is ten times greater at the higher temperature.

Since the drying power, *i. e.*, the power of causing evaporation, is that which exercises most influence on our health and comfort, it follows that humidity must always be considered in conjunction with temperature. When the drying power of the air is great, the evaporation of fluid from our skins and lungs is great. When the drying power of the air is small, the evaporation of moisture from the skin and lungs is small also. It follows from this that dry air is often of great use to persons suffering from what are known as chronic catarrhal conditions of the respiratory passages (throat, nose, windpipe, and bronchial tubes). The moist, mucous surfaces of these parts are, as it were, dried up by the dry air which is drawn over them, and the sufferings of the invalid are greatly lessened.

As regards the effect of the drying power of the air upon the skin, it is quite impossible to consider it apart from the question of temperature, because the amount of perspiration to be evaporated depends mainly upon the temperature (exercise being left out of consideration), and hence it follows that the amount of perspiration to be evaporated may be ahead of the drying power of the air. Hence it is not possible to consider the effect of drying power on the skin apart from the question of temperature, and we must therefore defer it until we come to talk of temperature.

The moisture in the air is due to the evaporating power of the sun. The heat of the sun is constantly raising water in the form of vapor; just as the water in a boiler is changed to vapor by the glowing fuel. In tropical regions the amount of water which is changed to invisible vapor is prodigious, but the evaporation in temperate climates is also very great, for it must be remembered that this

[1] From a lecture on "Climate in its Relation to Health," read before the Society of Arts by G. V. Poore, M. D., and published in the *Journal* of the Society.

evaporation goes on so long as the moisture in the air falls short of saturation.

The watery vapor in the air is of the greatest importance from a meteorological, and, therefore, indirectly from a climatic point of view. Mr. Scott, in his work on the "*Elements of Meteorology*," thinks that the distribution of moisture in the air is very local, and depends, to a great extent, on the proximity of free water surfaces to supply the moisture. It is, therefore, great in the air over tropical seas, slight in the air over extensive tropical deserts. The amount of moisture is generally more or less in direct relationship with the temperature. The dryness of the air during a Canadian winter is well known. The water is, to great extent, locked up in solid form, and the evaporating power of the air is slight, and hence the dry, crisp atmosphere, of the pleasures of which we hear so much. The amount diminishes as we ascend in a degree rather more than proportionate to the fall of temperature. The air of high mountains is relatively dry, but the degree of moisture follows no regular law, and it has been observed by balloonists, as well as mountaineers, that in ascending to great heights, strata of air of varying degrees of moisture are passed through.

The watery vapor ever present in the air acts like a garment to the earth, an invisible robe protecting the surface of the earth, on the one hand from the scorching influence of direct solar radiations, and on the other hand preventing, to a great extent, the radiation from the earth itself, and the too rapid loss of heat when the sun goes down.

Like our own garments, the invisible watery garment of the earth moderates the heat and cold, and tends to produce equability of climate. In situations where the moisture in the air is slight, the extremes of temperature are excessive, as in flat sandy deserts, and on mountains; the heat of the sun in these situations being in striking contrast to the bitter cold of the nights.

The watery vapor ever present in the air may become visible. Were I to bring a glass of ice-cold water into this room, its surface would be dewed with moisture, because the air in contact with the glass being suddenly chilled, its capacity for moisture is lessened, and a part of it is deposited.

When the surface of the earth is suddenly chilled by radiation, dew is in like manner deposited from the strata of air in contact with it. When a clear night succeeds a hot summer day, the deposit of dew is always (in this climate) very large. Dew, it will be noticed, is always most abundant on grass and herbage, on the leaves and stems of trees, on wood and metal work, etc., while it is not present on gravel walks and in dusty roads. Dew is, in short, deposited on those bodies which lose their heat most readily by radiation.

The heaviest fall of dew which it has been my lot to witness was on a winter's morning in January, on board a yacht off Cagliari, in the Island of Sardinia. I was roused about half-past seven by the pattering, as I thought, of heavy rain upon the deck, but on going on deck I found that the shower was exceedingly local, being produced by the deposit of dew upon the high spars and rigging of the yacht, and its subsequent descent upon the deck in a heavy shower. The power of the sun on the previous day had been very great, and had raised much vapor from the sea, and this moisture-laden air being cooled by contact with the cold spars and rigging, discharged its moisture in the manner related.

Humboldt has recorded how, in some of the forests of South America, the traveller on entering a wood finds, apparently, a heavy shower falling, whilst overhead the sky is perfectly clear. The formation of dew takes place on the tops of the trees, and so copiously, owing to the abundance of vapor in a tropical atmosphere, that a real shower of rain is the result.

Fogs and mists are due, it is now generally supposed, to the condensation of moisture on the infinitely fine particles which are always suspended in the air. If the air be absolutely free from dust, watery vapor forms no mist, but the presence of solid impurity determines a fog. For the formation of fog three things are necessary: —

1. The cooling of moisture-laden air.
2. Calm weather, so that the mist is not blown away as soon as formed.
3. Solid matter in the air.

When in winter the south-east wind blows, bringing moisture-laden air from the German Ocean and the Channel, up the estuary of the Thames, and when this moist air comes in contact with the cooler air of London, charged with solid impurity to an enormous extent, a London fog is the result. The fogs of Newfoundland are due to the chilling of moist air by coming in contact with a surface of water cooled by melting ice.

Most of the water evaporated from the surface of the salt and fresh waters of the globe returns to the surface in the form of rain.

Rain is produced by the chilling of air more or less charged with moisture. Near the equator the hot air charged with moisture rises into the cooler regions of the atmosphere, and descends again as rain, and in torrents of which we have no knowledge in these latitudes. Air which has traversed a large tract of sea, like that which comes to us from the south and west from off the surface of the Atlantic, is charged with moisture. As it strikes against the precipitous hills of our western coasts, it is chilled by the colder land, and, at the same time, is driven upwards by the conformation of the hills, and the result is that the moisture is deposited in the form of rain. Hence it follows that the southwest corner of Ireland and the western coast of England and Scotland are the wettest parts of the British isles, and in great contrast to the eastern coasts.

The wettest parts of the globe are those where winds blowing from tropical seas strike against the chilled tops of high mountains, and probably there is no place with greater rainfall than the district which lies at the eastern extremity of the Himalayan mountains, where the rainfall is said to amount to as much as four hundred inches a year.

Winds laden with moisture lose it at the first opportunity. Thus the southwest winds in this country cause heavy rainfalls on our western coasts, amounting to as much as one hundred and fifty inches per annum in some parts of Cumberland. The winds, thus dried by a fall of rain, can cause but little rainfall elsewhere, so that on our eastern coasts the rainfall is not more than twenty inches.

The centres of great continents are necessarily dry. The middle of Australia, Sahara, in the centre of Africa, and parts of Central Asia, are among the driest regions of the world.

What are the effects of moisture and dryness?

It is a well-known fact that when water is evaporated and turned into invisible vapor, that a certain amount of heat becomes latent, as it is termed, and cold results. When, on the other hand, watery vapor is condensed and becomes liquid, the latent heat is given out, and hence rain has a great power of warming the air. Professor Haughton has calculated that, on the west coast of Ireland, the heat derived from the rainfall is equal to half that derived from the sun.

The presence of rain-clouds has, of course, a great influence on the temperature of a district, as, by obstructing the sun's rays, they prevent the heating of the surface.

On the other hand, clouds equalize the temperature by preventing radiations of heat after sunset. Cloudless nights are cold nights, because of the comparatively unobstructed radiation. These are the nights when the gardener covers up his tender plants, and looks to his greenhouse fires. Cloudy nights, on the other hand, are warm.

Rainfall has a very purifying influence on the air, by washing it of its solid and some gaseous impurities. Who has not watched a thunder-shower after a spell of dry weather in London, in July or August? Previous to the shower the air is oppressive, and has a smoky, ammoniacal smell, and the wooden pavements, kept moistened by the watering-carts, smell like a stable. With the first drops of the shower, "blacks" as big as blue-bottle flies are driven downwards from the upper strata, these diminish as the shower continues, and soon the air smells fresh and wholesome.

As to the effect of moisture upon health, not very much is known. Rainfall purifies the air, and if it be not sufficient to prevent exercise it apparently does no harm. When the air is hot and moist, so that evaporation, with its consequent cooling, cannot be effected on the skin, it is very oppressive. Moist air is most grateful to persons with dry chronic coughs.

There is one way in which moisture affects health, and which has been not much considered hitherto, and that is the effect which it has on the process of decay and putrefaction. Putrefaction, as is well known, is favored by warmth and moisture, and is checked by cold and dryness. Warmth and moisture for the most part favor the growth of bacteria and other allied micro-organisms, some of which are definitely known to be directly connected with epidemic disease, while cold and dryness check them.

Parkes ("*Practical Hygiene*," page 37) remarks: —

"The spread of certain diseases is supposed to be intimately connected with the humidity of the air. Malarious diseases, it is said, never attain their fullest epidemic spread, unless the humidity approaches saturation. Plague and small-pox are both checked by a very dry atmosphere. The cessation of bubo plague in Upper Egypt after St. John's day has been considered to be more owing to the dryness than to the heat of the air.

"In the dry Harmattan wind on the west coast of Africa, small-pox cannot be inoculated, and it is well known with what difficulty cow-pox is kept up in very dry seasons in India."

If infective disease be due to organisms, and if the growth of these organisms depends upon conditions similar to those that regulate the activity of putrefaction and fermentation — facts in which there is a daily increasing belief — then we must come to the conclusion that dryness and cold both check one class of diseases, and that the biting dry east winds in this country, and the much-abused northwest wind which is known as the mistral in the south of France, are, although pitiless, and indeed often deadly to the sick and weakly, among our best friends from the point of view of health.

From the point of view of exercise and comfort, the absolute annual rainfall of a district is of less importance than the number of rainy days per annum. There is no necessary relationship between the annual rainfall and the number of rainy days; in fact, they often bear an inverse proportion to each other.

If we propose to visit a particular spot in search of outdoor exercise, pleasure, and health, this point of the number of rainy days to be expected is one of very great importance. Thus, at Valentia, on the west coast of Ireland, with a very mild even temperature, some 235 wet days per annum may be expected. According to Hassall, who is quoted by Weber, there is, at Torquay, an average rainfall of 36 inches, with 200 rainy days; at Ventnor, 34 inches, with 174 rainy days; at Cannes, 35 inches, with only 70 rainy days; at Bournemouth, 28 inches, with 156 rainy days; and at San Remo, 28 inches, with only 48 rainy days.

Although I have no doubt these figures give a fairly correct notion

of the relative raininess of the places mentioned, we must, nevertheless, be careful how we build our hopes upon average numbers. The average is sometimes calculated upon too small a number of years. Sometimes the years upon which the average is calculated are, so to say, picked, and the calculation, actuated by local bias, has begun with the year after, and stopped short of a year when some extreme number has been reached. Even supposing that the averages are in every way just, we must still remember that there are extremes as well as means, and we may have the bad fortune to visit a spot with a dry reputation and get a daily drenching. Such was my luck at San Remo, in the month of February, 1883.

TAR STAINS.

WASHINGTON, D. C.

To the Editors of the American Architect: —

Dear Sirs, — What will take out stains of pitch tar thrown on a brick wall by careless roofers, so that when the wall is painted it will not be defaced by the stain coming through? By giving answer in your next edition of the *American Architect* you will oblige very much one of your old subscribers. A. Pauli, Architect.

[We are told that the best way to remove the stains is to scrape off as much as possible of the tar-droppings and then apply coal-tar oil — as light-colored as it is possible to get. A thorough scrubbing with the oil will remove the tar, unless it has fallen on a painted surface: in this case to apply coal-tar oil would be simply to increase the mischief. — Eds. American Architect.]

AN ECHOING ROOM.

CLINTON, IOWA.

To the Editors of the American Architect: —

Dear Sirs, — I want some information on curing halls and court-rooms from echoes. Can you refer me to any book kept by you or others that treats of the laws of sound? I have heard of treating rooms with wires, with sounding-boards, with panel-work, etc. My problem now is a circular room 52 feet in diameter and 23 feet high; it echoes badly. Awaiting an answer, either by letter or in the *American Architect*, I am, yours truly, W. W. Sanborn.

["*The Acoustics of Public Buildings,*" by T. Roger Smith, published in Weale's (Lockwood's) Series, to be obtained through any bookseller for about $1.50, is the most practical work on the subject. Wires are chiefly useful for cutting off recesses which give local echoes. We should say that the way of curing the circular room lay in the direction of breaking up the wall-surfaces with pilasters, of considerable projection, and perhaps hanging cloth in the panels so formed. — Eds. American Architect.]

NOTES AND CLIPPINGS.

The Geology of Natural Gas. — Mr. I. C. White, a leading geologist, after a visit to the great gas wells struck in Western Pennsylvania and West Virginia, found that every one of them was situated either directly on or near the crown of an anticlinal axis, while wells that had been bored in the synclines on either side furnished little or no gas, but in many cases large quantities of salt water. Further observation showed that the gas wells were confined to a narrow belt, only one-fourth of a mile wide, along the crests of the anticlinal folds. These facts, Mr. White says, in science seemed to connect gas territory unmistakably with the disturbance in the rocks caused by their upheaval into arches, but the crucial test was yet to be made in the actual location of good gas territory on this theory. During the last two years Mr. White has submitted it to all manner of tests, both in locating and condemning gas territory, and the general result has been to confirm the anticlinal theory beyond a reasonable doubt. But while he claims that he can state with confidence that all great gas wells are found on the anticlinal axes, the converse of this is not true, viz., that great gas wells may be found on all anticlinals. In the theory of this kind the limitations become quite as important as, or even more so than, the theory itself, and hence he has given considerable thought to this side of the question, having formulated them into three or four general rules which include, practically, all the limitations known to him up to the present time that should be placed on the statement that large gas wells may be obtained on anticlinal folds, as follows: (*a*) The arch in the rocks must be one of considerable magnitude. (*b*) A coarse or porous sandstone of considerable thickness, or, if a fine-grained rock, one that would have extensive fissures, and thus in either case rendered capable of acting as a reservoir for the gas, must underlie the surface at a depth of several hundred feet (500 to 2500 feet). (*c*) Probably very few or none of the grand arches along mountain ranges will be found holding gas in large quantity, since in such cases the disturbance of the stratification has been so profound that all the natural gas generated in the past would long ago have escaped into the air through fissures that traverse all the bed. Another limitation might possibly be added, which would confine the area where great gas flows may be obtained to those underlaid by a considerable thickness of bituminous shale. Very fair gas wells may also be obtained for a considerable distance down the slope from the crest of the anticlinals, provided the dip be sufficiently rapid, and especially if it be irregular or interrupted with slight crumples. And even in regions where there are no well-marked anticlinals, if the dip be somewhat rapid and irregular, rather large gas wells may occasionally be found if all other conditions are favorable. The reason why natural gas should collect under the arches of the rocks is sufficiently plain from a consideration of its volatile nature. Then, too, the extensive fissuring of the rock, which appears necessary to form a capacious reservoir for a large gas well, would take place most readily along the anticlinals, where the tension in bending would be greatest. The geological horizon that furnishes the best gas-reservoir in Western Pennsylvania seems to be identical with the first Venango oil-sand, and hence is one of the Catskill conglomerates. This is the gas rock at Murraysville, Tarentum, Washington, Wellsburg, and many other points. Some large gas-wells have been obtained in the subcarboniferous sandstone (Pocono), however, and others down in the third Venango oil-sand (Chemung). In Ohio, gas-flows of considerable size have been obtained deep down in the Cincinnati limestone, while in West Virginia they have been found in the Pottsville conglomerate; hence natural gas, like oil, has a wide range through the geological column, though it is a significant fact that it is most abundant above the black slates of the Devonian.— *The Iron Age.*

Milk Paint.— It is said that when old Green Hill Protestant Episcopal church, on the Wicomico River, was built, in 1733, the people drove their cows to the building, milked them, and with the milk mixed the red ochre with which the pews were painted. The color still remains. The effort to restore the old church has taken a practical shape, and will be successful if its friends promptly respond to the appeals made in its behalf. — *Baltimore Sun.*

Petrified Wood. — The petrified wood found in the Rocky Mountain regions is rapidly becoming utilized. In San Francisco there is now a factory for cutting and polishing these petrifactions into mantle pieces, tiles, tablets and other architectural parts for which marble or slab is commonly used. Petrified wood is said to be susceptible of a finer polish than marble or even onyx, the latter of which it is driving from the market. The raw material employed comes mostly from the forest of petrified wood along the line of the Atlantic & Pacific Railway. Several other companies have also been formed to obtain concessions of different portions of these forests. Geologists will regret the destruction of such interesting primeval remains, and some steps ought to be taken to preserve certain tracts in their original state. — *Exchange.*

The Deepest Bore-hole. — The deepest bore-hole in existence, according to a paper read by Herr Mohs before the Magdeburg district association of the Society of German Engineers, is that reached in borings for coal near the village of Schladebach, on the railway between Corbetha and Leipzig, which have been made for some time in that locality at the instance of the Prussian Mining Department. The total depth of this bore-hole which has been driven with a hollow diamond-pointed rock-drill and water flushing, is 4559 feet. Its diameter at the bottom is 1.872 inches, and at the surface 11 inches. Boring operations have been carried on for three years and a half, and a sum of £5000 has been spent in reaching the depth attained. The temperature in the lower portion of the bore-hole was found to be 48° C., equal to 118.4° F. — *The Iron Age.*

Enduring Stair Treads. — What will withstand the tread of many feet and will for long continue to afford a firm foothold? The iron treads of the stairways, leading to the stations of the elevated railways in New York, became dangerously smooth and wore away rapidly. After tests with various materials, which were placed on successive steps of the same stairway, a rubber covering containing rungs of iron was selected as best suited for the purpose. The hard slate upon the stairways to the suspension bridge between New York and Brooklyn, has worn away so rapidly that it has been necessary to cover them with wood, which can easily be removed as the wear renders a new tread necessary. A wood mosaic composed of blocks of maple cut across the grain, is frequently used in vestibules of public buildings and in passenger elevators in place of ceramic tiles. The wood is rendered still more durable by boiling in linseed oil under pressure, until the pores are thoroughly impregnated with the oil which dries after boiling. — *Engineering.*

Two Similar Legends. — *St. James' Gazette* recalls pleasantly the oft-told story of the wooden image in Sené. From all the country round young girls pay a visit to the image for the purpose of sticking a pin into it. It is pretty well decayed by this time, and how many thousands of pins have been hopefully and yet fearfully driven into it no man can tell. If the wooden image had been a living man he would have died long ago of his many wounds. Those pins mean marriage; hence the earnestness with which they are contributed. They must be driven well into the wood, for if they fall out the betrothal will prove a failure. If they stay, however, the marriage will take place within a year. It must also be a strong pin, for if it bends in the driving the husband will be a hunchback or a cripple. We may laugh if we will, but if a wooden image of that sort were set up in this country, it would probably have all the pins it wanted, and some to spare. It is a foolish superstition, doubtless, but young girls like to be on the safe side in such matters. — *New York Herald.*

On the water side of Vera Cruz stands a stone image, whose bruised countenance tells a queer tale of feminine credulity. From time immemorial it has been believed that if a marriageable woman shall hit this image squarely in the face with a stone, she will immediately obtain a husband and an advantageous settlement in life. The inventor of the fable was evidently acquainted with the fact that women are not expert in throwing stones. Were it not for this lamentable disability the poor image would have been totally demolished years ago. As it is, the battered face has lost all semblance of features, and heaps of small stones, lying all about, attest the industry of the Mexican maidens, as well as their good sense in desiring matrimonial settlement. The tumble-down church, behind which it stands, has a remarkable number of female attendants, especially at vesper services. The homeward path lies directly past the image, and many a pebble is slyly tossed under the friendly shadow of the gloaming by women, young and old. — *Fannie B. Ward, in New York Sun.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

320,905. CLAY-CRUSHING MACHINE.—Frank Alsip and Chester T. Drake, Chicago, Ill.
320,918. SEWER-TRAP.—Louis Fall, Lima, O.
320,920. SCREW-DRIVER.—Nathaniel W. Farrand, Westfield, N. Y.
320,931. BEVEL-SQUARE.—Jonathan O. Grover, Lynn, Mass.
320,942. STONE-DRESSING MACHINE.—Jonathan Mann, Milton, Mass.
320,944. BRICK-MACHINE.—Henry Martin, Lancaster, Pa.
320,950. WATER-SUPPLY APPARATUS FOR WATER-CLOSETS.—Timothy McHugh, Boston, Mass.
320,974. FIRE-PROOF SHUTTER.—Charles C. Schreiber, Cincinnati, O.
320,979. FLEXIBLE ROOFING-TILE.—Lexor B. Snow, Cleveland, O.
320,990. PORCELAIN WATER-CLOSET BOWL.—Richard H. Watson, Philadelphia, Pa.
321,055. SASH-FASTENER.—William Robinson, Chicago, Ill.
321,081. DOOR-HANGER.—Chas. W. Bullard, Chicago, Ill.
321,109. CALCIMINE.—Karl A. Hohenstein, Brooklyn, N. Y.
321,120. ART OF MANUFACTURING PORTLAND CEMENT.—Robert W. Lesley and David Griffith, Egypt, Pa.
321,121. MANUFACTURE OF CEMENT.—Robert W. Lesley and David Griffith, Egypt, Pa.
321,137. COMPOSITION OF MATTER FOR FACING BROWNSTONE AND FOR MAKING ARTIFICIAL STONE.—Benjamin E. Ratcliffe, New York, N. Y.
321,143. HANDLE FOR SLIDING-DOORS.—Obadiah Seely, Syracuse, N. Y.
321,151. DOOR-HANGER.—Edward C. Stearns, Syracuse, N. Y.
321,180. EAVES-TROUGH HANGER.—Wilson C. Berger, Canton, O.
321,184. COMBINED BURGLAR-ALARM AND SASH-FASTENER.—John Brady, Philadelphia, Pa.
321,198. HANGING-DOOR.—Charles W. Emerson, Boston, Mass.
321,212. FIRE-ESCAPE.—Samuel Hargrave, Sr., and Arthur M. Lee, Pomona, Ill.
321,214. GIMLET-POINTED ROLLED WOOD-SCREW.—Hayward A. Harvey, Orange, N. J.
321,232. STEAM-RADIATOR.—John H. Lounsbury, Westfield, Mass.
321,233. COVERING FOR STEAM-BOILERS, ETC.—Jorgen G. Maardt, Copenhagen, Denmark.
321,245. WINDOW.—John S. Pihlström, Chicago, Ill.
321,268. SHUTTER-WORKER.—John N. Worthington, Springfield, O.
321,284. SASH-BALANCE.—Henry E. Dorman, Worcester, Mass.
321,295. GRAINING COMPOSITION.—Thomas Head, Copetown, Ontario, Can.
321,303. SAFETY DEVICE FOR ELEVATOR-CAGES, ETC.—Petrus F. Laarman, Amsterdam, Holland.
321,306. LOCK.—Thomas W. Markham, Huntsville, Tex.
321,336. LUMBER-DRIER.—Waller B. Beard, Jackson, Miss.
321,380. MORTISE-LOCK.—Patrick Murphy, Amesbury, Mass.
321,385. FIRE-ESCAPE.—William R. Pyne, Port-of-Spain, Trinidad, West Indies.
321,396. SHUTTER-WORKER.—George W. Stover, Laurelton, Pa.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report thirty-three permits have been granted, the more important of which are the following:

Patrick Roddy, 3 three-st'y brick buildings, s s Hillen St., between Front and High Sts.

Albert Mahone, 8 two-st'y brick buildings, w s, and 8 two-st'y brick buildings, e s, Seventeen-foot Alley, s of Tennant St., w of Mount St. and e of Fulton Ave.

Chas. Gantz, 6 two-st'y brick buildings, w s Ann St., n of Eager St.; 9 three-st'y brick buildings, e s Broadway, commencing s e cor. Preston St.; and 7 three-st'y brick buildings, s s Preston St., between Holbrook and Aisquith Sts.

Theresa Volk, three-st'y brick building, n w cor. Castle and Lombard Sts.

Boston Fear, 11 two-st'y brick buildings, e s Carrollton Ave., commencing s e cor. Comity Lane; and 12 two-st'y brick buildings, w s Carlton St., s of Comity Lane.

M. A. Parks, 7 two-st'y brick buildings, e s Nanticoke St., between Cross and Stockholm Sts.

M. R. Scott, three-st'y brick building (square), w s Fulton Ave., n of Patterson Ave.

John O. Ruhier, 10 two-st'y brick buildings, n s Lafayette Ave., commencing n w cor. Calhoun St., and 3 two-st'y brick buildings, w s Calhoun St., n of Lafayette Ave.

A. Krebs, 6 two-st'y brick buildings, commencing n w cor. West St. and Burgunder Alley, and 2 two-st'y brick buildings, w s Burgunder Alley, n of West St.

John G. Schoh, three-st'y brick building, w s Harford Ave., s of Lanvale St.

Struven & Walker, three-st'y brick building, e s Boston St., between Chester and Aliceanna Sts.

S. D. Price, 4 three-st'y brick buildings, e s Barclay St., and 4 three-st'y brick buildings, w s Constitution St.

R. W. Dorney, three-st'y brick building, n w cor. Lombard and Calhoun Sts.

J. F. Foley, three-st'y brick building, w s McKim St., between Chase and Biddle Sts.

J. M. Cone, 22 three-st'y brick buildings, s s Harlem Ave., between Fremont and Brune Sts., and 9 two-st'y brick buildings, w s Brune St., between Harlem and George Sts.

Boston.

BUILDING PERMITS.—*Wood.*—*Mellville Ave.*, near Dorchester Ave., dwell., 14′ 3″ and 20′ x 47′ 6″; owner, Elbridge Smith; builder, H. P. Oakman.

Savin Hill Ave., near Grampian Way, dwell., 27′ x 37′ 6″; owners, Emily and Mary Rigby; builder, same as last.

Mercer St., *No.* 26, dwell., 21′ and 24′ x 36′; owner, James Ferguson; builder, J. A. Allen.

Magazine St., near Clayton Pl., dwell., 24′ x 42′; owner, Patrick O'Connor; builder, Thomas Clune.

Richfield St., near Columbia St., dwell., 22′ and 25′ x 29′; owner, Samuel B. Pierce; builder, Wm. J. Jobling.

Richfield St., near Columbia St., dwell., 22′ and 25′ x 29′; owner, J. Homer Pierce; builder, same as last.

Richfield St., near Columbia St., dwell., 24′ x 29′; owner and builder, John S. Darcy.

Richfield St., near Columbia St., dwell., 24′ x 29′; owner and builder, John Robbins.

Atwood Ave., near Day St., dwell., 31′ x 30′ 6″ and 36′ 6″; owner, L. C. Curtis; builder, Wm. Tobin.

Boylston Ave., near Green St., dwell., 25′ x 41′; owner, Dennis Doyle.

Chestnut Ave., near Green St., dwell., 23′ x 28′; owner, Mary A. Burton; builder, E. Johnson.

Charles St., *Nos.* 19 *and* 19½, dwell., 19′ 6″ x 41′; owner, Mrs. M. A. Snow; builder, John Bass.

Hilton St., near Wentland Ave., dwell., 16′ x 23′; owner, Mary J. Simmons; builder, S. R. Simmons.

Brooklyn.

BUILDING PERMITS.—*Fulton St.*, n w cor. Nostrand Ave., four-st'y brick tenement, tin roof; owner, Mrs. Julia Diefendorf, Bryant Building, New York; architects, G. P. Chappell & Co.; builder, S. C. Whitehead.

Evergreen Ave., *Nos.* 381-387, 4 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $4,500; owner, architect and builder, J. A. S. Simonson, 389 Evergreen Ave.

Grove St., n s, 82′ e Evergreen Ave., 2 two-st'y frame and brick dwells., tin roofs; cost, each, $3,500; day's work; owner, architect and builder, same as last.

Grand St., s e cor. Agate St., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,900; owner and architect, M. Weisshaar, Greene and Nostrand Aves.; builders, M. Kuhn & Son and J. Rueger.

Grant St., s s, 47′ e Agate St., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $1,350; owner, etc., same as last.

India St., n s, 375′ w Manhattan Ave., three-st'y brick store and tenement, tin roof; cost, $5,500; owner, J. J. Kelly, 406 East Sixtieth St., New York; architect, M. D. Randell; builders, Smith & Gately and M. Bant.

Baltic St., n s, 246′ e Fourth Ave., 3 two-st'y brick dwells., tin roofs, wooden cornices; cost, $3,500; owner, J. H. Wooley, Butler Ave. or Orient Ave.; architect, R. Dixon.

Baltic St., n s, 189′ e Fourth Ave., 3 two-st'y brick tenements, tin roofs, wooden cornices; cost, $4,000; owner and architect, same as last.

Skillman St., *No.* 70, w s, 25′ s Park Ave., three-st'y frame (brick-filled) tenement, gravel roof; cost, $6,000; owner, J. H. Kohlman, Park Ave., cor. Skillman St.; architect, J. G. Glover; mason, C. Collins.

North Seventh St., n s, 175′ e Fourth St., 2 brick tenements, one three-st'y and stores and one four-st'y, tin roofs; cost, each, $9,000; owner, Hugh Clark, North Seventh St.; architect, E. F. Gaylor; builders, M. Smith and J. Fallon.

Madison St., n w cor. Throop Ave., 2 four-st'y brown-stone tenements and 7 private dwells., tin roofs; cost, each, $9,000; owner and builder, P. F. Ryan, Hewes St.; architect, E. F. Gaylor.

Quincy St., n s, 225′ e Franklin Ave., four-st'y brick and stone tenement, gravel roof; cost, $10,000; owner and builder, Paul C. Grening, 420 Gates Ave.; architect, A. Hill.

Livingston St., *Nos.* 185 *and* 187, five-st'y brick store, tin roof; cost, $14,000; owners, Wechsler & Abraham, 430 Fulton St., architect, G. L. Morse.

Halsey St., n s, 315′ e Nostrand Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, $8,500; owner and builder, Wm. Shindeu, 216 Herkimer St.; architect, M. Walsh.

Willoughby Ave., n s, 131′ 6″ e Kent Ave., two-st'y brick dwell., tin roof; cost, $4,000; owner and builder, George Browley, 250 Steuben St.; architect, M. J. Morrill.

Howard Ave., s e cor. Jefferson St., three-st'y brick store and dwell., tin roof; cost, $6,190; owner, Owen Mulvey, 67 Howard Ave.; architect, B. O'Rourke; builders, J. H. O'Rourke and T. S. Priestley.

Sixth Ave., n e cor. Sixteenth St., three-st'y brick store and dwell., tin roof; cost, $7,000; owner, M. Duffy, Sixth Ave., cor. Sixteenth St.; architect and contractor, T. Corrigan; mason, W. Corrigan.

Grand Ave., w s, 100′ n Willoughby Ave., 3 four-st'y brick tenements, tin roofs; cost, each, $9,000; owner, John N. Eitel, 257 Carlton Ave.; architect, C. F. Eisenach; builders, T. Donlon and J. T. Hanlon.

Monroe St., s e cor. Sumner Ave., 5 two-and-a-half-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner and builder, D. S. Beasley, 39 Pulaski St.; architect, I. D. Reynolds.

Waverly Ave., e s, 100′ s Myrtle Ave., four-st'y brick and brown-stone tenement, tin roof; cost, $12,000; owner, Cornelius Donnellon, 116 Pacific St.; architects, G. P. Chappell & Co.

Hart St., n s, 226′ e Marcy Ave., two-st'y brick dwell., tin roof; cost, $4,000; owner, architect and builder, P. Dunnon, 110 Tompkins Ave.

Lafayette Ave., n s, 30′ w South Oxford St., three-st'y brick club-house, slate and tin roof; cost, $25,000; owner, Oxford Club, South Oxford St., cor. Lafayette Ave.; architect, J. Mumford; builders, J. Ashfield & Son and W. S. Wright.

McDonough St., n s, 120′ and 280′ w Lewis Ave., 6 three-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, P. Sheridan, 775 Myrtle Ave.; architect, J. Harbison; builder, P. Sheridan.

Central Ave., w s, 102′ n Myrtle St., three-st'y frame tenement, tin roof; cost, $4,000; owner, M. Harman, Central Ave., near Myrtle St.; architect, J. Platte; builders, K. Mahler and T. D. Eadie.

Nineteenth St., s s, 225′ w Sixth Ave., 2 three-st'y frame tenements, tin roofs; cost, each, $3,000; owner, architect and contractor, J. Mahoney, 1007 Third Ave.; mason, O. O'Kief.

Manhattan Ave., w s, 175′ s Nassau Ave., four-st'y frame (brick-filled) store and tenement, gravel roof; cost, $6,000; owners and masons, Gately & Smith, 569 Lorimer St.; architect, A. Van Dien.

Douglass St., s s, 90′ e Fifth Ave., 10 two-st'y brick dwells. and two-st'y extension, tin or excelsior roofs; cost, $4,000; owner, W. H. Jackson & Co., Madison Sq., New York; architect, F. L. Hine; builder, H. E. Fickett.

Hancock St., *No.* 704, s e, about 200′ e Reid Ave., two-st'y brick factory, tin roof; cost, $9,000; owner, W. Woerle, on premises; architect, F. Holmberg; builder, D. Distler.

Heyward St., s s, 120′ w Lee Ave., 6 three-st'y brick flats, tin roofs; cost, each, $6,000; owner and builder, R. Healey; architect, I. D. Reynolds.

Broadway, w s, 57′ e Park Ave., 2 four-st'y brick stores and tenements, tin roofs; cost, each, $16,500; owner, Theresa Adelman, 3 Sheriff St., New York; architect, F. Holmberg; builder, J. Rueger.

Johnson Ave., *No.* 121, three-st'y frame (brick-filled) store and tenement, tin roof; cost, $3,800; owner, M. Joeller, on premises; architect, H. Vollweiler.

Twenty-third St., s s, 225′ w Fifth Ave., three-st'y frame tenement, tin roof; cost, $3,800; owner, A. Ostergreen, on premises; architect and builder, J. Sorenson.

North Sixth St., *No.* 201, 177′ e Fifth St., four-st'y brick tenement, tin roof; cost, $8,500; owner, Mrs. J. M. Selvage, 209 Hewes St.; architect, Th. Engelhardt; builders, G. Lehrian & Son and Geo. Ross.

Putnam Ave., n s, 25′ w Sumner Ave., 8 three-st'y brown-stone dwells., gravel roofs; cost, each, $8,000; owner and architect, John C. Bushfield; builder, not selected.

Nostrand Ave., n w cor. Lexington Ave., 5 four-st'y brick stores and tenements, gravel roofs; cost, each, $9,000; owner, Jos. P. Puels and Wm. J. Northridge, on premises; architect, P. F. Thomas.

ALTERATIONS.—*Furman St.*, *Nos.* 159 *to* 160, rebuild river front, iron beams, etc.; cost, $4,000; owner, John Watson, 68 Gold Street, New York; builders, Hazzard's Sons & Co. and Mr. Sonne.

Gallatin Pl., five-st'y and basement brick extension, front and interior alterations; cost, $8,000; owners, Wechsler & Abraham; architect, G. L. Morse.

Chicago.

BUILDING PERMITS.—Mrs. M. Parrott, 10 two-st'y dwells., 221-237 Wilmot Ave.; cost, $20,000.

J. Bonn, 2 two-st'y dwells., 75 and 77 Jay St.; cost, $5,000.

M. Bickel, two-st'y flats, 612 West Nineteenth St.; cost, $2,500.

B. Quirk, two-st'y flats, 124 Walnut St.; cost, $3,500.

J. Halpack, two-st'y dwell., 560 West Twentieth St.; cost, $2,500.

Mrs. O. Chisholm, two-st'y dwell., 552 Jackson St.; cost, $1,500.

H. Krolovece & Bros., three-st'y flats, 676-582 West Twenty-first St.; cost, $8,000.

Mrs. C. Salles, two-st'y dwell., 708 Madison St.; cost, $4,500; architect, A. Smith.

J. Speich, two-st'y dwell., 1247 Fulton St.; cost, $3,000.

W. M. Hoyt, four-st'y flats, 45 and 47 Pine St.; cost, $17,000; architect, L. B. Townsend.

M. Urhanus, two-st'y factory; cost, $2,500.

J. Kraemer, two-st'y flats, 189 Hoyne Ave.; cost, $2,800.

J. Osborn, two-st'y dwell., 509 Oakley St.; cost, $2,600.

C. Schwartz, two-st'y flats, 285 and 287 Fulton St.; cost, $1,000.

C. Schwartz, three-st'y flats, 289 Fulton St.; cost, $2,500.

W. E. Hale, alterations, s w cor. Washington and State St.; cost, $10,000; architects, Ackerman & Smith.

W. Steinmetz, two-st'y dwell., 336 Dayton St.; cost, $2,500.

C. Seibrantz, two-st'y flats, 621 North Lincoln St.; cost, $1,500.

S. Oleson, three-st'y flats, 92 Sedgwick St.; cost, $6,000.

J. Orsna, two-st'y store and dwell., 638 Throop St.; cost, $4,000.

A. Ciskowsky, three-st'y dwell., 157 Bissell St.; cost, $1,000.

J. Nowak, three-st'y store and dwell., 117 Bunker St.; cost, $3,600.

G. C. Wallace, two-st'y store and flats, 468 and 470 Taylor St.; cost, $14,000.

J. Schieferstein, three-st'y store and flats, 295 Division St.; cost, $18,000; architect, E. Baumann.

C. Manke, two-st'y store and dwell., 449 Twenty-sixth St.; cost, $1,600.

B. Hazelquist, three-st'y dwell., 293 West Ohio St.; cost, $3,000.

A. Simon, two-st'y dwell., 209 Bissell St.; cost, $3,000.

H. Stampe, two-st'y dwell., 632 West Harrison St.; cost, $5,000.

A. Schackmann, three-st'y dwell., 510 Dearborn Ave.; cost, $15,000; architect, T. Karls.

The Board of Education, three-st'y school-house, 982-988 Wilcox Ave.; cost, $40,000; architect, J. J. Flanders.

H. Barnard, two-st'y dwell., 3241 Rhodes Ave.; cost, $7,000; architect, W. A. Furber.

W. G. Jackson, 2 two-st'y dwells., 935 and 937 Adams St.; cost, $5,500; architect, C. M. Palmer.

F. Tierney, four-st'y store and flats, 221 West Twelfth St.; cost, $7,000.

P. Johannes, three-st'y store and dwell., 3601 Halsted St.; cost, $10,000.

A. M. Billings, one-st'y condensing-house, Division St.; cost, $5,000.

J. Fitzpatrick, two-st'y dwell., 3112 Fifth Ave.; cost, $3,000.

J. Sargent, two-st'y dwell., 744 Warren Ave.; cost, $2,500.

C. W. & E. Partridge, 2 two-st'y dwells., 3721 and 3723 Lake Ave.; cost, $6,000.

A. P. Johnson, two-st'y dwell., 695 North Robey St.; cost, $8,500.

R. Berl, two-st'y store and dwell., 1544-1516 Milwaukee Ave.; cost, $6,500.

The Abbey Estate, one-st'y addition, 251 and 263 Wabash Ave.; cost, $5,000.

J. Palatreich, three-st'y store and flats, 322 West Chicago Ave.; cost, $5,000.

J. Pent, two-st'y dwell., 20 Evans Ct.; cost, $2,500.

Mrs. Olson, three-st'y dwell., 369 Twenty-fifth St.; cost, $5,000.

Mrs. M. Carberry, two-st'y dwell., 80 Union Park Pl.; cost, $4,000.

J. L. Coles, three-st'y store and dwell., 633 North Clark St.; cost, $7,000.

Detroit, Mich.

Board of Education, two-st'y addition, Webster School; cost, $18,000.

Candler Bros., alterations to dwell., 559 Woodward Ave.; cost, $4,000.

Ferdinand Kuhn, block of brick buildings, 192-198 East Adams Ave.; cost, $10,500.

Lane & Deitz, brick dwell., Fremont St.; cost, $3,000.

G. W. Buffam, brick dwell., 17 Joy St.; cost, $4,500.

D. W. Fales, brick dwell., 692 Cass Ave.; cost, $3,500.

Patrick Dee, two-st'y brick and frame dwell., Ferry St.; cost, $5,000.

Bradford Smith, 4 brick stores, 888-890 Michigan Ave.; cost, $8,000.

Board of Education, two-st'y brick school-house, Kentucky St.; cost, $20,000.

A. G. Varney, two-st'y brick dwell., Lincoln Ave.; cost, $4,500.

W. J. Mandy, 3 double frame stores, St. Aubin Ave.; cost, $5,250.

G. H. Osgood, 3 frame dwells., Campan Road, cost, $3,600.

Lane & Deitz, double brick dwell., 91-93 Ledyard St.; cost, $10,000.

Board of Education, addition to Duffield School; Macomb St., cost, $12,000.

Also add to Jefferson School, cor. Crawford St. and Selden Ave.; cost, $12,000.

Robert Dunn, three-st'y brick manufactory, 79-81 Brush St.; cost, $3,000.

Thos. Fairbairn, two-st'y brick dwell., 136 Lafayette Ave.; cost, $8,000.

Philip Letourneau, three-st'y brick dwell., 497 Cass Ave.; cost, $6,500.

New York.

In this excessively hot weather, the only news is on things problematical. Builders do not seem very anxious to figure, and are all busy on work started in the spring.

Flats.—On the s w cor. of Fifty-eighth St. and Sixth Ave., an apartment-house 82′ 10″ x 100′ of brick, granite and iron, is to be built for Messrs. Harris Bros.; from plans of Messrs. A. Zucker & Co.

On the s e cor. of Avenue A and Fifty-fifth St., 8 apartment-houses, 25′ x 80′ each, are to be built for Mr. R. Guggenheimer; from plans of Messrs. A. B. Ogden & Son, at an estimated cost of $150,000.

Houses.—On the n s of Seventy-eighth St., 250′ w of Ninth Ave., 6 three-and-four-st'y basement, high stoop houses, 16′ x 18′ fronts, are to be built for Mr. B. S. Levy; from plans of Mr. R. Guastivino.

Institutions are proposing to put some work on the market:

The St. Vincent de Paul Orphan Asylum will have a four-st'y and basement addition, 48′ x 48′ of brick and Ohio stone, built at a cost of $60,000; from plans of Mr. W. H. Hume.

The Home for the Relief of the Destitute Blind, will have a building erected on the s w cor. of Tenth Ave. and One Hundred and Fourth St., 100′ x 125′, three-st'y and basement, native stone first st'y, and above brick and brown-stone, to cost about $55,000; Mr. F. Carlos Merry, architect.

The Children's Aid Society will erect a new building, 47′ x 93′, five-st'y and basement, brick and stone, to be situated on Eighth St. and Avenue B; from plans of Messrs. Vaux & Radford.

Building Permits.—*Hester St*, *No.* 25, five-st'y brick tenement, metal roof; cost, $15,000; owner, Rachel Kurzman, 383 Grand St.; architect, John B. Snook.

Maiden Lane, Nos. 138 *and* 140, five-st'y brick storehouse and office-building, tin roof, owner, John Carle, Jr., 153 Water St.; architect, W. B. Tubby.

Canal St., No. 112, five-st'y brick tenement with stores, metal roof; owner, Lorillard Spencer, Paris, France, architect, J. B. Snook.

Beekman St., Nos. 146 *and* 148, four-st'y brick store and lofts, tin roofs; cost, $12,000; owners, Elizabeth S. Jones and Harriet D. Potter, 46 West Thirty-ninth St.; architect, G. B. Post; builders, James B. Smith and V. J. Hedden & Sons.

Varick St., s e cor. King St., 5 three-st'y brick stores and dwells., tin roofs; cost, $40,000; owners, Corporation of Trinity Church, 5 Church St.: architect, Chas. C. Haight; builders, Robinson & Wallace and David Hepburn.

Waverley Pl., w s, 60′ n Eleventh St., 2 three-st'y brick dwells., tin roofs; cost, each, $6,000; owner, Mrs. Hester A. Gregory, 219 West Eleventh St.; architect, W. B. Tuthill.

Fifty-ninth St., s s, 250′ e Second Ave., 4 five-st'y brick tenements, tin roofs; cost, each, $18,000; owner, James T. Meagher, 325 East One Hundred and Twenty-third St.; architects, Thom & Wilson.

East Sixty-ninth St., No. 21, four-st'y brick (stone front) dwell., tin and slated roof; cost, $26,000; owners, architects and builders, Charles Buek & Co., 500 Madison Ave.

East Sixty-ninth St., No. 23, four-st'y and basement brick dwell., tin and slated roof; cost, $20,000; owner, etc., same as last.

East Sixty-ninth St., No. 25, four-st'y and basement brick dwell., tin roof; cost, $40,000; owner, etc., same as last.

East Sixty-ninth St., No. 27, four-st'y and basement brick dwell., tin roof; cost, $30,000; owner, etc., same as last.

East Sixty-ninth St., No. 29, four-st'y and basement brick dwell., tin roof; cost, $26,000; owner, William Openhym, New Jersey; architects, etc., same as last.

Eighty-eighth St., n s, 54′ 6″ e Third Ave., five-st'y brick flat with store, tin roof; cost, $10,000; owner, John H. Gray, 1564 Park Ave.; architect, J. McIntyre.

Eighty-eighth St., n s, 74′ 6″ e Third Ave., three-st'y brick workshop, tin roof; cost, $4,000; owner and architect, same as last.

One Hundred and Third St., n w cor. First Ave., one-st'y brick tenement, tin roof; cost, $3,000; owner, John Simon, 136 Chrystie St.; architect, A. Arctander.

Avenue A, s e cor. Eighty-second St., five-st'y brick (stone front) tenement with store, tin roof; cost, $24,000; owner, Stephen Pendergast, 1158 Second Ave.; architects, A. B. Ogden & Son; builders, Walsh Bros.

Second Ave., s w cor. One Hundred and Third St., five-st'y brick tenement with store, tin roof, owner, Margaret A. Murray, 315 East One Hundred and Sixteenth St.; architect, A. Spence.

Third Ave., s w cor. Ninety-sixth St., five-st'y brick tenement with stores, tin roof; cost, $22,000; Leo Schlessinger, 128 East Seventy-fourth St., and Jos. Hecht, 44 East Sixty-eighth St.; architects, Schwarzmann & Buchman.

Third Ave., w s, 20′ s Ninety-sixth St., 3 five-st'y brick tenements with stores, tin roofs; cost, each, $21,000; owner, etc., same as last.

Avenue A, s e cor. Eightieth St., five-st'y brick factory, tin roof; cost, $15,000; owner, Geo. P. Lies, 313 East Seventeenth St.; architects, Schwarzmann & Buchman.

Avenue A, e s, 46′ 8″ s Eightieth St., five-st'y brick tenement, tin roof; cost, $18,000; owners and architects, same as last.

Sixty-third St., n w cor. Ninth Ave., five-st'y brick flat, tin roof; cost, $25,000; owner, T. Farley, 402 West Seventy-third St.; architects, Thom & Wilson.

Sixty-third St., n s, 25′ w Ninth Ave., 4 three-st'y brick (stone front) dwells., tin roofs; cost, each, $16,000; owners, T. Farley & Son, 402 West Seventy-third St.; architects, Thom & Wilson.

Sixty-ninth St., s w cor. Ninth Ave., five-st'y brick flat, tin roof; cost, $45,000; owner, Hugh Blesson, 1262 Lexington Ave.; architect, Wm. Baker.

Sixty-ninth St., s s, 30′ w Ninth Ave., 4 four-st'y brick (stone front) dwells., tin roofs; cost, each, $22,000; owner and architect, same as last.

Eighty-second St., n s, 100′ w Tenth Ave., 6 three-st'y brick dwells., tin and slated (fire-proof sheathing) roofs; cost, each, $12,000; owner, Richard W. Myers, 131 East Sixty-third St.; architect, William Baker.

Seventh Ave., n w cor. One Hundred and Thirty-fourth St., 7 three-st'y brick dwells., tin roofs; cost, total, $50,000; owner, Patrick J. O'Brien, One Hundred and Forty-third St., near Eighth Ave.; architect, A. Spence.

One Hundred and Thirty-fourth St., n s, 65′ w Seventh Ave., 2 three-st'y brick dwells., tin roofs; cost, total, $14,000; owner and architect, same as last.

Fleetwood Ave., n e cor. One Hundred and Seventy-sixth St., two-st'y brick dwell., slate roof; cost, $9,600, owner, August Koelseh, 838 Sixth Ave.; architect, John C. Kerby.

Mott Ave., e s, 152′ s One Hundred and Forty-ninth St., 2 three-st'y brick dwells., tin roofs; cost, each, $5,000; owner, G. W. Walker, 367 West Thirty-sixth St.; architect, W. L. Goetchius.

North Third Ave., No. 390, two-st'y brick packing-house, felt and gravel roof; cost, $7,700; owner, Francis J. Schnugg, 433 East Eighty-sixth St.; architect, Robert Fay; builder, Wm. Somerville.

Third Ave., w s, abt. 100′ s One Hundred and Seventy-ninth St., 2 two-st'y frame dwells., tin roofs; cost, $5,000; owner, Thomas Brown, 126 East Twenty-seventh St.; architect, C. C. Churchill; builders, Jas. McGarity and Louis Falk.

Alterations. — *Fifth Ave., No.* 411, n e cor. Thirty-seventh St., area deepened and internal alterations; cost, $6,000; owner, Mary Lewis, Tarrytown, N. Y., or on premises; architect, H. R. Marshall; builders, W. & T. Lamb, Jr. and P. Haughey.

Grand St., No. 281, one-st'y brick extension, tin roof, new store front, internal alterations and connection made with adjacent buildings; cost, $10,000; owners, J. Liebenstein & Son, 283 Grand St.; architect, J. Kastner.

Third Ave., No. 136, extension raised one st'y; cost, abt. $1,500; lessee, James Plavano, on premises; owner, Wm. Bird; architect, E. Gandolfo.

Greenwich St., Nos. 309-313, repair damage by fire; cost, $4,984; owner, Mrs. Mary Stuart, 961 Fifth Ave.; G. G. Williams, attorney; builder, E. Smith.

Philadelphia.

Building Permits. — *Parrish St.*, e of Forty-second St., 15 three-st'y dwells., 16′ x 42′; Fred Michaelson, owner.

Mehl St., e of Main St., two-st'y dwell., 16′ x 42′; Wm. Garvin, contractor.

Preston St., bet. South and Ogden Sts., three-st'y dwell., 26′ x 35′; S. Smith, contractor.

St. Paul's Pl., w of Sixteenth St., 10 three-st'y dwells., 24′ x 26′; Jas. Williams, superintendent.

Race St., No. 1510, in rear, addition to school-house, 23′ x 30′; Richards & Shourds, contractors.

Third St., s w cor. Canal St., ice-house, 16′ x 45′; O. Schmidt, contractor.

Marriott St., e of Fifth St., altering stable to dwells., 14′ x 39′; Daniel Kidd, contractor.

Tacony St., three-st'y dwell., 30′ x 60′; Thomas McCarty, contractor.

Eighth St., above York St., two-st'y dwell., 16′ x 50′; Chas. Schuck, contractor.

Fifth St., cor. Eustace St., two-st'y dwell., 16′ x 28′; Thos. Grinnan, contractor.

Twenty-fifth St., e of Poplar St., 25 two-st'y dwells., 16′ 6″ x 40′; Jno. M. Sharp, owner.

Sunnyside St., w of Thirty-fifth St., 4 two-st'y dwells., 15′ x 32′; J. F. Richards, contractor.

Fisher's Lane, e of Main St., two-st'y brick building, 16′ x 33′; S. R. McDowell, contractor.

Howard St., No. 2341, three-st'y store, 14′ x 65′; J. Meanholt, contractor.

Franklin St., bet. Unity and Pine Sts., blacksmith shop, 23′ x 30′; Geo. Swope, owner.

Mascher St., No. 1303, three-st'y factory, 22′ x 58′; C. G. McMullin, contractor.

Manayunk St., crematory, old Greek style, pilasters, bases, columns and architraves to be of granite; walls of brick; roof to be surmounted by a cupola, both covered with copper, 80′ x 100′; Wm. Gelte, architect.

Ellsworth St., Nos. 1337 *and* 1339, 2 three-st'y dwells., 16′ x 58′; Chas. O'Neill, contractor.

Christian St., No. 224, three-st'y dwell., 20′ x 52′; W. H. Messick, contractor.

Park St., w of Twenty-second St., 2 two-st'y brick buildings, 14′ x 30′; Jas. E. Thorp, contractor.

Eadline St., w of Forty-fourth St., two-st'y addition, 24′ x 28′; Stacy Reeverson, contractor.

Rochester N. Y.

Building Permits.—Plans have been prepared for a new four-st'y business block, cor. of Spring St. and Plymouth Ave., 100′ on Spring St. and 65′ on Plymouth Ave., for John Mogridge; Warner & Brockett, architects; W. N. Gorshire, contractor.

Otis & Crandall, architects, are preparing drawings for the following buildings: —

Three-st'y brick manufacturing-building on Spring St., for Thomas Swift & Sons.

Three-st'y brick business block on Smith St., for Michael Keenan; material to be brick, with cut-stone trimmings.

Three frame houses on Perkins St., for Paul Luchleitner.

House for J. L. Luckey, Lake Ave.

Double frame house on Charlotte St., for the Misses Dick.

They are also preparing plans for a large livery-stable for J. W. Graves, to be located in the eastern part of the city.

Walker & Nolan, architects, are engaged on the following work: —

Stone dwell. on Portsmouth Terrace, for J. R. Fanning.

Brick dwell. on West Franklin Square, for J. S. Brown.

Cottage house on Prospect St., for E. A. Medcalf.

St. Paul, Minn.

Building Permits. — Two-st'y stone and brick veneer stores and dwell., e s of Bates Ave., bet. Hudson and Bium Sts.; cost, $3,500; owner, August Sctracht.

Two-st'y brick double dwell., s s of Weniford St., bet. Greenwood and Clinton Sts.; cost, $2,490; owner, H. F. Langelyt.

Three two-st'y frame dwells., s s of Summit Ave., bet. Snelling and Macalester Sts.; cost, $3,500; owners, B. F. Wright and R. P. Lewis.

Two-st'y frame dwell., s s of Summit Ave., bet. Snelling and Macalester Sts.; cost, $7,500; owners, B. F. Wright and R. P. Lewis.

Two-st'y frame dwell., s s of Terrace Ave., bet. Wilder and Moore Park; cost, $2,000; owner, C. D. Parker.

Two-st'y frame dwell., n s of Holly Ave., bet. Arundel and Mackubin Sts.; cost, $5,000; owner, Geo. S. Baxter.

Alteration of front to three-st'y brick stores and offices, s s of Fourth St., bet. Wabasha and Cedar Sts.; cost, $4,000; owner, J. L. Merriam.

Two-st'y frame dwell., s s of Portland Ave., bet. Kent and Dale Sts.; cost, $5,000; owner, E. P. Wilga.

Two-st'y brick veneered barn, s s of Summit St., St., bet. Western and Walnut Sts.; cost, $4,500; owner, F. Driscol.

Two-st'y frame dwell. and store, s s of Margaret St., bet. Sunien and Arcade Sts.; cost, $3,500; owner, Nicholas Wilmer.

Three-st'y brick store and dwell., e s of West Seventh St., bet. Chestnut and Eagle Sts.; cost, $5,000; owner, Wm. Foulke.

Two-st'y frame dwell., n s of Oakly St., bet. Lyndhurst and Westwood Sts.; cost, $2,000; owner, E. A. Fitzgerald.

Two-st'y frame dwell., n s of Hancock St., bet. Howell and Laurel Ave.; cost, $2,000; owner, E. R. Moore.

One-and-one-half-st'y frame dwell., w s of Dale St., bet. Holly and Hennepin Sts.; cost, $2,150; owner, G. M. Sawyer.

Three-st'y brick block stores and hotel, n s of East Fifth St.; bet. Wabasha and Cedar Sts.; cost, $35,000; owner, A. R. Carpehart.

General Notes.

Allentown, Pa. — The site has been chosen and arrangements nearly completed for the erection of a silk mill here, 50′ x 250′, with wings of the same dimension. John Pyle, of Paterson, N. J., is the original mover of the enterprise.

Anne (Arundel Co.), Md.—St. Paul's parish building; cost, $17,000.

Additions to Mt. Calvary Church; cost, $7,000.

Repairs and improvements in All Hallow's Church.

T. B. Ghequier, Baltimore, architect for above.

Anoka, Minn. — The construction of the new city-hall is in charge of Aldermen Browning, Page and Woods. The contract for the foundation has been



Heliotype Printing Co., Boston.

THE JEFFERSON-MARKET (THIRD DISTRICT) COURT-HOUSE, NEW YORK, N. Y.

FREDERICK C. WITHERS, Architect.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. NO. 501.

AUGUST 1, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE death of General Grant has been followed by a discussion upon the subject of the proper disposition of his remains, which has a certain interest for architects. No particular town seems to have an unquestioned claim upon the great general, but it is understood that within the last few weeks of his life he had expressed a wish that his body might rest in the beautiful grounds of the Soldiers' Home at Washington, near the scene of his greatest efforts and his happiest successes; and, in case there should be any objection to this, the officers in charge of the West Point Military Academy had requested that the Academy enclosure might be honored by the tomb of its most illustrious pupil; but both these modest suggestions were summarily swept aside by the enterprise of the great city of New York, which immediately appointed a huge committee of its most eminent beer-sellers, brokers, politicians and railroad-men to "take charge of" a "memorial" of some unexplained sort, and telegraphed the most extravagant offers of a burial-place in any or all the city parks. It was hardly possible to decline, or even to evade, such an overwhelming invitation, and Colonel Frederick Grant, to whom it was left only to choose a spot among the different parks, selected the upper end of the Mall in the Central Park, just at its junction with the Terrace. For the site of an imposing *monument*, such as the people of New York seemed determined to erect, this was an excellent choice; the centre of the Terrace, which is designed as the focus of the artistic treatment of the Park, being, in the eyes of New Yorkers, the most august spot in the New World, but it does not seem to have suited the ideas of many people, particularly of His Honor the Mayor, who held a conference with the representatives of the family, the result of which was a change in their opinions, and the final selection of a place in the Riverside Park for the interment of the deceased soldier. This decision seems to have been received by his Honor with singular joy, and the park, which is now a neglected and remote strip of unimproved land, adjoining the Hudson River Railroad tracks, along the western edge of the upper part of the island is to be immediately put in order for the funeral ceremonies. Beyond the close proximity of a large iron foundry to the site selected for the temporary tomb, there is no particular objection to the Riverside Park as a resting-place for the bodies of weary mortals, who, as the Mayor says, do not like to feel themselves "lying remote from Nature," and who are afraid that "in the heart of a great, busy city, in the rush and hurry of the life of which death and its sacredness may be forgotten, the remains of even the great dead may be passed in thoughtlessness." But to stow away a costly monument, to the most distinguished person of the age, in an uncultivated and uninhabitable strip of land in the rear of the present metropolis, for fear that some one may pass it by "in thoughtlessness," seems to us to be carrying æsthetic sensitiveness too far. A large part of the park slopes so steeply to the river as to be nearly invisible from the Riverside Drive which borders it, besides being almost inaccessible, as well as impassible for anything except goats, and those persons who desire to approach the monument through the park from the lower part of the city will have to ascend or descend in various singular ways before they reach it. This circumstance may keep away "thoughtless passers-by," but it is also very likely to give inconvenience to more worthy persons, and we can see no prospect that any one will be benefitted by the new choice of ground except the owners of the cheap and neglected lots fronting the Park, who will probably have reason to be grateful to the deceased general for the advertisement which their property will derive from the proximity of his remains. We sincerely regret that it has been thought best to neglect the obvious claims of the Soldiers' Home at Washington.

WHILE the major part of the nation professes to be overcome with grief at the death of General Grant it may not be unjust to surmise that there are certain forehanded designers who, having the inevitable result clearly in mind, have spent a portion of the last few months in preparing to meet the demand which is already declaring itself for a monument worthy of his memory. Experience has shown that the designs which are brought forward soon after the death of a great man savor too much of the ready-made art of the cemetery stone-yard, and it seems to us that we may do something to preserve our cities and our art from the desecration of a crop of Grant memorials similar in general demerit to the average of the "soldiers' monuments" which were erected soon after the war in so many towns and villages. Apart from the national memorial which we believe will be promptly provided — the history of the Washington Monument having been so recently rehearsed should prevent the flagging of the energies of those to whom the matter may be entrusted — it is likely that there will be many other memorials undertaken by large cities and towns, less costly ones, but perhaps for that very reason more meritorious. It would probably be a great service to local monument-committees if their deliberations could be enlightened as to what might be accomplished in monumental art by other than local talent or by those pushing outsiders who are ever on the lookout for a job. We trust that there are amongst our readers many who will look on this occasion as we do, as offering a signal opportunity of accomplishing something in behalf of monumental art in America, and a way of giving pause to the misdirected enthusiasm of monument-committees by affording a means of displaying to them that there are so many ways of treating such a problem that it would be most unwise to hastily adopt the first design that might be laid before them.

THEREFORE we will invite our readers to lay aside their prejudices against competitions; forget that the ideas they evolve may be pilfered from them, so that they may lose both glory and profit; disregard for the moment that a more legitimate and authorized competition will probably soon be announced; overlook the fact that the reward we may be able to offer is wholly incommensurate with the task, and stimulated only by a desire to indirectly prevent the erection of an unknown number of monumental burlesques, and to show the world what the American architect can accomplish when such a theme is placed in his hands, we ask the profession at large to contribute preliminary sketches for: "A monument to General Grant, to be erected by a large city at a cost of not more than $100,000." This general proposition, we think, will be enough to set pencils at work feeling round the subject, and will prepare the way for a more detailed programme which we will publish next week.

WE have received extracts from the Denver papers, which indicate that twenty-one sets of drawings were submitted in competition for the State Capitol of Colorado. Six of these are said to have been sent in by local architects, and the rest by persons outside of the State. As no description of them is given beyond a transcript of the mottoes on them, we can make no comments on the plans further than to say that the author of one of them labels his work "*Labor Amoris*," so we suppose that he will be quite contented if he does not get any pay for it. The drawings have been insured for twenty thousand dollars, and it is estimated that the work on them has cost thirty thousand, so that this seems to represent pretty fairly the contribution which the architectural profession has made for the purpose of giving the Capitol Commissioners the privilege of choosing from among a score of plans without paying for them. It is true that thirty-three hundred dollars are to be

divided among the authors of the best three plans, but the architects who made the others will have to console themselves with the reflection that their time and skill have been thrown away, for the amusement of those who would very probably have been willing and anxious to pay a good price for it if they knew that they could not have it otherwise. Whether the Capitol Commissioners will secure a great bargain in the plans they select, remains to be seen. If they are quite ready, like some other Capitol Commissioners of whom we recently heard, to order and pay for extra work from time to time as their building progresses, "to strengthen walls found too light to bear the superstructure," or to "excavate for new boiler-rooms, those built according to the plans having been found inadequate," or to patch and bolster in other ways as they go along, no doubt a cheap plan by a cheap architect, will suit them and their constituents as well as any; but if they wish to procure for the State of Colorado a public building which shall be thoroughly, carefully and beautifully designed, inside and out, and so executed that it will continue for generations to reflect more and more honor upon the skill and science of the author, they must find a man who is capable of doing such work for them, and must pay him what his time and skill are worth. It would be hard to say which is the greatest folly, to think that there is economy in confiding the construction of a great public building to amateurs and cheap experts, or to imagine that first-class architectural service can be had, by any sort of dodging or bargaining, at less than the regular price. We are perfectly ready to concede that even a cheap competition may bring to light an architect of brilliant genius which had previously remained hidden; but to persuade, delude, force or frighten this brilliant person into devoting, for the wages of a day-laborer, as much time and skill to the main part of his work as his professional friends give for pay which secures to them and their families a comfortable living so long as they are engaged on important commissions, is beyond human power, as those who attempt it usually find to their cost.

THE Associated Factory Mutual Fire Insurance Companies have just issued one of their occasional reports, or circulars in which, among other things, they give copies of the admirable regulations of the Pennsylvania Railroad Company in regard to disinfection. It is not very evident why mutual insurance companies should trouble themselves to disseminate rules for preventing the spread of cholera, but, considering the influence that mill agents are in a position to exercise upon a particularly careless and dirty class of people, the committee which prepared the report deserves credit for the thoughtful public spirit which suggested the incorporation of such useful matter in a paper which the agents of all mills connected with the companies will be sure to read. According to the theory of the Pennsylvania Railroad rules, "far more than half" of disinfection is simply cleanliness, and consists in collecting and burning at short intervals all rubbish, garbage, or decaying animal or vegetable matter. If this is done with scrupulous care, and no water used for drinking which can, by any possibility, have been contaminated by the drainage from cesspools, sewers, vaults, stables or garbage, there will be little use for disinfectants, except for the purpose of preventing persons who bring disease with them into a clean and healthy community from infecting others. To guard against these cases of imported disease, the Pennsylvania Railroad Company has had large quantities of disinfecting fluid prepared, containing two and three-quarters pounds of chloride of zinc, with one and three-quarters ounces of chloride of copper, dissolved in a gallon of water. This standard solution is sent from the Altoona shops, on requisition, to any part of the line, and is used, according to printed directions pasted on the bottles, for washing out the urinals and water-closets of passenger cars, being mixed for this purpose with about sixteen times its volume of water; and, mixed with eighty parts of water, for washing all portions of passenger cars. The same liquid, mixed with water, is used for disinfecting the discharges of sick persons, and a towel, saturated with it, is recommended for deodorizing contaminated places. Where it is not convenient to procure this solution, which costs only a few cents a gallon, the railroad authorities advise the use of battery residues from telegraph stations, mixed with common salt in the proportion of a pound-and-a-half of salt to each gallon of residues, the liquid so obtained to be diluted with water for various purposes in the same proportions as the standard solution. Where iron stains are not objectionable, copperas, or sulphate of iron, is recommended as one of the best common disinfectants, and a solution of two pounds in a gallon of water may be thrown into vaults, cesspools, sinks and sewers, and upon moist, decaying garbage, with excellent effect. In cases where it can be economically used, ice is also spoken of as an excellent disinfectant. Decomposition takes place very slowly in a liquid cooled by ice, and for this reason it is directed that a lump of ice shall be carried in the urinal of every passenger car on the Pennsylvania Railroad while the car is in service.

ANOTHER architect in England has had to sue his client to get his poor pay with the usual result. In this case, which is known as Taylor and Locke *vs.* Greene and Son, the plaintiffs, composing a firm of architects brought suit to recover twenty-two hundred and fifty dollars, the balance due them for services in preparing plans and drawings, with other professional work, for the rebuilding of a certain business structure. The defendants in resisting this claim, brought forward the usual tale of woe, to the effect that among other things, the architects had not sufficiently considered or warned them about the claims of neighboring owners in regard to light and air, and that through this neglect disputes had arisen between the defendants and their neighbors, involving the former in expenses amounting to eighteen thousand dollars, which, as they claimed, the architects ought to pay. The reply of the architects to this was simply that they had been engaged to do the work of architects, under the instructions of the defendants, and that they had done this, and nothing more. Although the trial lasted seven days, and a great deal of evidence was brought forward, the jury seems to have retained through the whole the view of the matter that juries usually take, and promptly returned a verdict for the plaintiffs for nineteen hundred dollars and costs. So far as we can judge from the brief but clear account which we find in the *Builder,* this seems to have been one of those cases where a man, having engaged a young or over-amiable architect to do a certain piece of professional work, imagines that he has a claim upon his time and services to any extent, and for any purpose, and keeps him trotting about, investigating, negotiating and inquiring in regard to matters which do not come at all within an architect's province, however convenient it may be for the architect's employer to have him busy himself about them without charge; and after getting all the work out of him that he can, avails himself of all the disappointments that he may have experienced in the results of the errands which he has persuaded the architect to do for him to cut down the pay due him for his legitimate services. There are plenty of such men in the world, and plenty of architects who suffer from them, but the number of the latter would be smaller, if the younger members of the profession fully understood how little respect a court accords to any pretext whatever for depriving a man of any part of the money which he has earned by reasonably skilful and faithful services in his own vocation.

THE *Builder* gives a brief description of the Krupp cannon foundry at Essen, in Prussia, which will surprise even those who know something of the extent to which the concentration of capital in the hands of individuals is often carried abroad. The whole number of workmen now employed by Herr Krupp exceeds twenty thousand. Many of these are attached to the foreign iron mines or smelting-works belonging to the establishment, but something like one-half live with their families in Herr Krupp's houses at Essen. In addition to the great cannon foundry at home, the works include five hundred and forty-seven different iron mines in various parts of Germany, besides several in the Bilbao district in Spain, the product of which is converted into iron in eleven smelting furnaces, and fifteen hundred and forty-two puddling and reheating furnaces. Four hundred and thirty-nine boilers, supplying four hundred and fifty steam-engines, furnish one hundred and eighty-five thousand horse-power for moving the machinery of the establishment, and the product of three coal mines is consumed at the Essen works alone. For transporting materials and other goods about the works thirty-seven miles of railway are laid, with an equipment of eighty-eight locomotives, and eight hundred and ninety-three freight-cars; and thirty-five private telegraph stations, with forty miles of wire, serve to transmit directions between the various portions of the works.

AN ITALIAN WORKINGMEN'S COLONY.

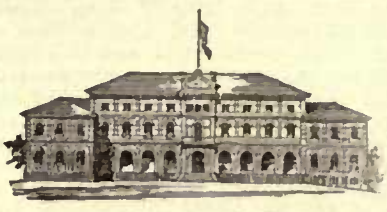


Sig. Rossi's Memorial to his Workmen, Schio.

TO one who has travelled only in the south of Italy, nothing would seem more hopeless than to expect from the people any noteworthy attempts to solve the important questions of the relations between laborer and employer, or to provide suitable homes for the working classes. But that in these directions the nation as a whole is rapidly waking up to its grand possibilities, is abundantly proved by the number of instances found throughout the north, of careful, intelligent work of a nature and quality such as, with us, the Italians seldom receive credit for; and there are some parts of the land which afford to the American student subjects for study quite aside from those of a purely artistic character. There have been large proprietors in Italy ever since the world began, almost, but only lately have any systematic attempts been made to improve the condition of the working classes, especially the mill operatives, the class which always requires the most serious attention, and in many countries is apt to be the most neglected. Of course such attempts have the greatest success when made by the mill owners, and what has been accomplished through the instrumentality of Signor Alessandro Rossi, at Schio, is, it is hoped, an example which may speedily be followed in other parts of the country. There is abundant field for such work all through Italy.

Schio can almost be called, on a small scale, the Manchester of Italy. It is a manufacturing city of some ten thousand inhabitants, located among the foot-hills of the Alps, about twenty miles north of Vicenza, near the boundary between Austria and Italy. The industries of the place are confined chiefly to wool manufactures. The largest factory was established in 1817, by Francesco Rossi, to whom succeeded, in 1845, his son, the present owner, the Senator Alessandro Rossi. In 1872 the latter founded a stock company, which included in its operations the original factory and seven others in the immediate vicinity. The works now employ about five thousand hands, the greater portion of whom are inhabitants of Schio. Signor Rossi appears to have been strongly imbued with a sense of the necessity for helping his workmen towards a better condition of living than they could obtain for themselves; for when the company was organized, a clause of its charter provided that five per cent of the net profits should annually be devoted directly to the wants of the operatives, the disposition of this amount to be at the discretion of the directors. This was not to be considered as a charity, Signor Rossi believing that the workmen who helped him earn his money were themselves entitled to a share in the profits beyond their mere wages. In this way, during the eleven years ending with 1883, the workmen's shares have amounted to about five hundred thousand francs, besides which the company has given a direct endowment of five hundred thousand francs for the support of the workmen's institutions founded by it, and Signor Rossi from time to time has added large gifts in his own name, so that up to the present time not far from one million five hundred thousand francs have been expended in the building and maintenance of the houses, schools, dwellings, etc., with which the hands of the *Lanificio* Rossi are now so well provided. Hence it will be seen that neither money nor good will were lacking to make Schio a model manufacturing town.

The workmen's quarter occupies an area of about forty acres, in the pleasantest and most healthy portion of the town, and is immediately adjacent to the larger factory. The streets are wide, well paved, and planted with shade trees, and the houses have a clean, attractive appearance, which must add considerably to the satisfaction of the inhabitants. Signor Rossi is a thorough democrat, as he has proved by building in the centre of the quarter a house which is occupied by his son, and in which the Queen of Italy was entertained in 1876. The quarter is kept in thoroughly good order, and with its magnificent surroundings of mountain scenery is certainly a model settlement so far as location and appearance can go. At the end of the principal street is the *Asilo di Maternità*, or day-nursery, a large, comfortable-looking building, one story in height, with a wide, covered porch across the front, and an inviting-looking garden all around. The babies are received here as young as fifteen days. The mothers bring them in the morning, returning two or three times during the day to nurse them, and take them home at night. The children are taken care of until they are three years old; and a healthier, happier-looking set of babies than the one hundred and twenty who are daily cared for it would be hard to find. A sister of charity has charge of the institution. While at the nursery the babies are neatly clad in little red and blue frocks, and given baths, or allowed to sleep in the cool, clean dormitory, or trotted about in the shady garden, and given an abundance of good, wholesome food, when they are able to receive it; and the result of all this care is a rising generation of young wool-workers which must gratify the heart of Signor Rossi. Between the ages of three and seven years, the children of the operatives are received into an *Asilo Infantile.* The building is large, covering an area of twelve hundred square metres, and is two stories high, with large, well-arranged class-rooms, and an assembly-hall capable of seating all of the four hundred and sixty children who are daily received here. It has also a large dining-room, where at noon the little ones are given a good, substantial meal, such as, doubtless, some of their parents never have more than once a week. The *Asilo* further has connected with it a bath, a gymnasium, and a small medical dispensary, all entirely free to the children of the operatives. This school building and its appointments would be a credit to any city. Nearly half a million francs have been spent on this one institution, and for its purpose nothing better could be desired. The teaching is largely on the Froebel system, besides which the girls are instructed in needlework and drawing, with results which are quite surprising, considering the age of the pupils and the class to which they belong. The health of the children is carefully looked after, and that the working classes have been physically benefited by this systematic care of the young lives is abundantly proved by the increase in the proportion of strong, robust young men during the fifteen years that the schools have been in operation.



Asilo Infantile, Schio.

Between the ages of seven and twelve years, the children of the workmen are received in an elementary school, where they obtain a good common-school education, sufficiently extended for their needs as future factory hands; while of course, if desired, the children can, after leaving here, go to the Commune school supported by the city. The running expenses of the *Asilo Infantile* and the elementary school together amount to about forty-six thousand francs per year.

Any one visiting these various institutions cannot but be forcibly impressed with the clean, healthy and contented appearance of the children, and also with their good behavior, for they are apparently taught manners as well. When a stranger enters the room they all rise and remain standing until he departs, saluting him with a cheery "*favorisca.*" Indeed our Boston school children might with profit learn a few lessons from these little embryo operatives of Schio. At the time of our visit to the *Asilo Infantile*, in one of the rooms a rosy-cheeked little girl, not over five years old, stepped up to the blackboard at the teacher's request, and courtesying prettily to us, wrote out in a big, round hand the word *America;* and in the embroidery class some fine needlework was shown, which would have done credit to a child ten years older than the little baby who presented it to us. The education given, while not very extensive, is quite thorough, and we found that the officers of the mill were glad to put their children at school with the children of the operatives.

The *Lanificio* Rossi receives workers as early as the age of twelve years, though no children are allowed to work unless they give evidence of possessing a strong, robust constitution. For the benefit of those who are obliged to work but wish to educate themselves further, a night school has been established, which is largely attended. It is worthy of note that since 1871 the proportion of illiteracy in the commune of Schio has decreased by more than fifteen per cent.

Signor Rossi has further done a great deal towards putting his operatives in the way of becoming owners of comfortable, well-built homes. He has erected thus far some sixty-seven houses, representing a total value of three hundred and seventy-four thousand seventy-six francs, which have been sold to the workmen on terms extending through ten years or more. Signor Rossi lets out the money at four per cent, and affords every facility to the workmen to meet the payments. A clear title to the property is not given, Signor Rossi, in the name of the company, retaining a supervisory authority over all, in order to prevent either unlawful speculation in the houses, to the detriment of the class for whose benefit they are built, or neglect of the premises by the owners themselves. Four hundred and eighty of the operatives are at present owners or part owners of these houses. Several different types of dwellings have been erected, and repeated experiments made to discover which is best suited to the wants of the workmen, with a final choice in favor of houses in rows, separated only by party-walls, with small gardens in front and rear. The plan adopted certainly has the merit of simplicity, as will be seen by reference to the sketch-plan (see Illustrations), made from memory, of a house which was visited and inspected by their majesties King Humbert and Queen Margherita, as a prominent tablet over the front door testifies. The house is about twelve feet wide in the clear. Under the whole is a high, dry cellar, with access both from within the house and from the rear garden. The first story consists of a single large room which serves as a kitchen, dining-room and parlor. At one corner, enclosed by a light board partition, are the stairs leading up to the second story, which is divided into a large sleeping-room at the rear and a small one in front, cut off by the stairs. There is no hallway, and the front room is reached only by passing through the rear chamber. There is a third story

divided into two equal rooms, and a low loft used only for storage. When sold by Signor Rossi, this house was only two stories high. The floors are of square larch beams, covered underneath with rush netting and plastered, and above laid with good pine flooring, an unusual thing in Italy, most of the floors being of cheap concrete mosaic, and always cold and disagreeable. The kitchen stove or fireplace is of masonry, and of the standard type such as is found among the ruins of Pompeii, and has always been used by the Italians, everything being cooked by an open fire, with no oven of any sort. The chambers of the house are not heated. The walls are built of good, substantial rubblestone work, stuccoed outside and plastered within. The roof is of tiles. The total cost, including the land, was a little over three thousand francs. There is no supply of water nor drainage works of any description. Water-pipes are, however, laid in all the streets of the new quarter, and at the corners are hydrants, from which a full supply of water of a most excellent quality is constantly flowing, drawn from the neighboring mountains. The houses are all provided with out-of-door privies, built of brick, over tight cesspools, the emptying of which is attended to by the Commune.

To meet the requirements of very modest purchasers, some of the houses are built one story in height only, but with walls, framing of floors, etc., arranged so that another story can be added as the family increases in number or in means. This style of house seems to be much sought after, the families, even when large, preferring to begin on a small scale. In some cases two stories have been added to the original one-story structure. Of course such additions are made only by permission of Signor Rossi.

The house first described is a model of cleanliness throughout, the brass pots in the kitchen and the wooden floors being scrubbed and polished in a manner which would delight the heart of a Dutch housekeeper. The little garden in front is all abloom with roses and early spring flowers, and the walks are neatly gravelled. The owner evidently takes considerable pride in his house. Nor is it an exceptional instance, for it is one of a block of six or eight houses similar in plan and dimensions, each of which is as neat and tidy as the one visited, while in the adjacent blocks in every direction are groups of equally interesting houses, each group differing somewhat in external appearance, so that there is no barrack, made-to-order look about the colony. Most of the houses are painted in light colors, and all seem to be throughout in good condition. Nowhere in the quarter is there any appearance of anything like misery or even want. Indeed Signor Rossi thinks too much of his workmen to let them suffer while he is able to help them, and in return the operatives are uniformly faithful to their employers, and strikes or labor disturbances have never been known at Schio. Most of the work in the factory is by the piece, only twenty-three per cent of the operatives receiving fixed wages. In case of sickness or accident an allowance is made to the disabled, and in case of death the family is taken care of by the company.

Besides the separate dwellings such as those above referred to, the *Lanificio* Rossi has built a few houses expressly for the use of the old operatives, who are pensioned as long as they live, and if able to do any work at all are provided with material to spin at home, and so earn a few extra francs. There are also a few houses which are rented to those who do not care to buy, and at least one comfortable-looking house divided into separate rooms and rented to single men. Some of the houses in the new quarter are quite pretentious, as the officers of the mill have not disdained to avail themselves of the opportunities afforded to the workmen. A few are built with pretty, half-timbered Swiss work, and all of them show good taste on the part of the builder. The architect of all these houses was Signor A. Negrin, of Vicenza.


Church of San Antonio, Schio.

There are a number of other institutions which have been founded or fostered by Signor Rossi, including a large swimming-bath at which the charge is but five centimes; added to which are a number of single bath-rooms, at twenty-five centimes each. There is also a wash-house supplied with an abundance of hot-water from the condensers of the factory engine, where wives of the operatives can do their washing without charge. A Society of Mutual Help has been founded, with a capital of thirty-eight thousand eight hundred and twenty-one francs. It has about seven hundred members, and possesses a library of over a thousand volumes, most of them given by Signor Rossi; coöperative stores, which, with the help of the all-powerful senator, obtain provisions, clothing, etc., at bottom prices, its operations amounting to two hundred and fifty thousand francs per year; a furniture magazine, on the same principle, for the benefit of the operatives, handling eighty thousand francs' worth of household effects yearly; and a workingmen's club, which is provided with books, periodicals, etc. All of these enterprises are located in good, commodious quarters, and the workmen, as far as possible, are made to feel that they belong to them. There is also a comfortable little theatre for the use of the employés, and, by opposition, a handsome stone church built almost entirely by Signor Rossi and presented by him to the commune.

There are no hospital arrangements of any sort, but the Society of Mutual Help has established a system of medical service, of which the expense is divided among the subscribers; ice, medicine and attendance being furnished as required. Schio is, however, in a very healthy location, and there are few doctors' bills to pay. No liquors of any sort are allowed to be sold in the new quarter. Most of the workmen manufacture their own wine, and the city is little troubled with intemperance.

In the *American Architect* of April 4, 1885, an account was given of the *cités ouvrières* at Mülhausen, in Alsace. It is interesting to compare the work accomplished there with what has been done at Schio. In the first case it is the work of a society which avowedly aims only to build houses and sell them without losing money. In the second it is the work of an individual who is doing all in his power to make his workmen happier and healthier. At Mülhausen the houses are for sale to any one who may wish to buy. At Schio everything has been done exclusively for the operatives of the *Lanificio* Rossi, and the other inhabitants of the town profit only indirectly by the improvements. Mülhausen gives a man time and tells him to help himself. Schio gives a man pleasant homes, the best of schools, and helps him in everything, caring almost entirely for his children during the first seven years of their existence. The one is self-reliant in its effects, the other paternal in its care. The results at Schio are far more satisfactory in every respect, and yet, should Signor Rossi die or the *Lanificio* Rossi go to ruin, which is not an impossible event, we question if the well-equipped institutions would long survive, and whether in the long run the narrower, less generous plan followed at Mülhausen would not be productive of the most lasting good. C. H. BLACKALL.

ENGLISH ARCHITECTURAL POTTERY.

TILES, TERRA-COTTA AND "DOULTON WARE."


Fig. 1.

THERE are numerous extant examples of pottery produced by the inhabitants of Britain before the Roman times, which are usually discovered in the mounds which the Britons erected over their dead, and are accompanied by bronze and bone implements as well as by axes, arrow-heads, knives, etc. It was not, however, until the thirteenth century that decorative tiles were made in Britain. Amongst some of the oldest specimens of glazed tiles employed in England may be mentioned the pavement discovered in the Roman Priory Church at Castle-Acre, Norfolk, a portion of which is in the British Museum. These tiles are ornamented with scutcheons of arms, and some bear the name of "Thomas;" the execution of them is exceedingly coarse, the cavities not being filled with clay of a different color, and they are greatly inferior to the Norman tiles of the same period. Glazed decorative tiles were much used in Mediæval times for paving sacred edifices, and they are sometimes called Norman tiles by old writers, from the supposition that they originated in Normandy. In Northern France there are some specimens of great age, although no tiles have as yet been discovered to coincide with the features of the Norman style of decoration, the most ancient being apparently of the thirteenth century. During the course of the fourteenth century some artistic skill was conspicuously shown in carved stone-work, metal-work and missal painting in Great Britain; it seems to have extended occasionally to pieces of pottery, but the records of such fine ceramic work are practically confined to a single group of this class.

The so-called encaustic tiles used for the floors, and to some extent for the walls, of ecclesiastical and domestic buildings since the beginning of the thirteenth century show, for the most part, a much higher degree of artistic and technical skill than did such other ceramic works of British craftsmen of the time, as have come down to us. The artistic execution of these tiles rapidly improved until they began to show decided merits of design: it is impossible that they were made in the great religious houses themselves, and these we know,

borrowed some of their arts from Continental sources, especially from Italy; but it is probable that the great stimulus to this class of pottery production in Great Britain, was largely imparted by the Normans.

Stone had supplied all the wants of the Normans until the twelfth century, but from this time new ideas everywhere appeared at once: tiles of red-earth of various forms were substituted for stone, their surface being covered with a thin layer of white glaze in which were encrusted patterns of darker earth, or *vice versa*. They were arranged in a graceful checker-work, rosettes, trefoils and scrolls of notched leaves were formed, and combined with graceful borders: sections of divided circles were ornamented with stars or heraldic suns. Warriors heavily armed and clad in armor, and mounted upon richly caparisoned horses, busts, lions, eagles and all other things that fancy and heraldry could generally invent, animated the cold pavements. Most of the ornamental combinations resemble the designs we are accustomed to see in the textile fabrics of the East, and we ought to be the less astonished at this when we remember the visits of the Crusaders to Syria, to Byzantium and Palestine, where this character of ornamentation was so largely employed from the ninth to the twelfth century.

The manufacture of decorative mediæval tiles in England, rapidly developed from the thirteenth until the sixteenth century, and in some districts even down to a later period. Kilns have been discovered at Malvern and other places in Worcestershire, in Gloucestershire, Wiltshire, Shropshire and Staffordshire. The earliest tiles were of one color, while the designs upon them were either incised, or impressed, or embossed. Inlaid tiles were next produced, these being in fact first impressed, and then having had the hollows filled with a differently colored clay; this kind came to be finally distinguished by rich design and excellent workmanship. Sometimes small tiles of different shapes and colors were arranged in composite patterns of geometrical characters.

The use of several colors laid on a single tile indicates a later time. The tiles of the Chapter House at Westminster, the Abbey Church of Malmesbury, Lillestall Priory in Shropshire, Malvern Priory Church, Prior Cuddin's Chapel at Ely, Gloucestershire Cathedral and Chertsey Abbey may be mentioned as illustrating the several varieties of tiles we have named.

Two examples of these encaustic tiles are given in Figures 1 and 2; the first being from Monmouth Priory, and the second from Great Malvern.

There are in existence a great many English earthern-ware vessels, which we generally attribute to a time at least as early as the Tudor period, 1485–1603, and usually they are of a buff color, having a fairly hard body, covered nearly all over with a green enamel. Upon some specimens of similar ware we notice letters or dates as on the stove tile in the British Museum which is of Elizabeth's time, but this piece is, however, made from a red clay. This style is shown in Figure 3, and exhibits an amount of technical accomplishment hardly usual at the time in English native wares of this class, and it is probable that it may be of German origin.



Fig. 2.

The glaze of the English tiles which we have thus far mentioned, was produced either by lead or a glassy substance, generally by the former from its being applied in the form of powdered galena, the chief ore of lead, a compound of that metal with sulphur. The use of red lead, one of the oxides of lead, and of glass containing as a chief ingredient a fusible native silicate, such as felspar, is of later date; but when common salt was introduced as the material for glazing earthenware an entirely new departure in ceramic production was made, and now in the present time large quantities of architectural pottery are glazed with salt. The salt glaze can be imparted only at a very high temperature, and it is therefore necessary that the material to which it is applied should be capable of withstanding a high degree of heat without fusing or even softening, or in other words, the clay must possess refractory properties.

Lambeth has lately come forward as a prominent place in England for the manufacture of architectural pottery of all kinds. The early history of Lambeth as a pottery centre is somewhat obscure, but we learn from English patent reports that in 1671, a patent was granted by the English Government to John Ariens Van Hamme, a Dutch potter, who had settled in Lambeth, for "the art of making tiles, porcelain and other earthern-ware after the way practised in Holland." The pottery of Messrs. Stiff & Sons, which is called the "London Pottery" was established in Lambeth as early as 1751; and the "Lambeth Pottery," that of Messrs. Doulton & Co. in 1818.

Nottingham stoneware has been famous since about the middle of the eighteenth century, and the Castle Museum at Nottingham possesses several good examples of this fine brown stoneware, one tile in particular impressed with geometrical ornaments, and measuring five-and-one-quarter inches square, is a rare and unusual piece, and is thought to have been a part of a pavement from the house of a former owner of the pot-works.

Bristol and Liverpool became famous for their delft toward the latter part of the seventeenth century. Frank's delft works, where large numbers of tiles for fireplaces and dairies were painted and otherwise ornamented, were founded in Bristol toward the close of the seventeenth century, and the factory continued in operation until about one century ago, when delft ware had ceased to be fashionable. Another manufacturer of delft ware in Bristol was Joseph Flower. It is difficult to distinguish between the wares produced by the two manufacturers in Bristol, and it is equally difficult to attach dates to the uninscribed pieces; but a tile picture representing St. Mary Radcliffe, and bearing the arms of Bishop Butler, now in the Museum of Practical Geology, has been examined by the writer, and as Bishop Butler's episcopate extended from 1738–1750, its date can be approximately ascertained.



Fig. 3.

It is thought that Mr. Willitt's large picture which is composed of seventy-two tiles, and which depicts "Hogarth's March to Finchley," was painted in about 1754. Pairs of pictures for the fireplace composed of nine tiles, each representing a dog and a cat as guardians of the hearth, were at one time not uncommon in Bristol dwellings, and in one of these tile pictures a dog has the word "Bristol" impressed upon its collar with the date 1754.

Liverpool excelled all other centres of delft manufacture in transfer-printing on this class of pottery, and the process was developed there by two separate printers as early as the middle of the eighteenth century. The process was a very rapid one, and the inventors, Sadler & Green, readily printed five hundred tiles with different patterns in six hours without assistance. These tiles measured about five inches square, and in addition to being better potted were much harder than the Dutch tiles imported at the same period. The printing was in either black or red, and the tiles were employed for lining stoves and walls, and became quite fashionable. In some of these tiles theatrical characters were not infrequently represented as shown in Figure 4, which is taken from a tile in the panel owned by the South Kensington Museum.



Fig. 4.

Regarding the influence of Josiah Wedgwood on English ceramics, it is hardly necessary to remark that although he has had many imitators, he has had no equals. It would be impossible in an article of this character, to fully enlarge upon the merits of the numerous leading manufacturers of architectural pottery in England; but even in a sketch of this kind it is not possible to omit the name of Mr. Herbert Minton, to whose great energy and practical intelligence, the revived art of architectural pottery manufacture in England owes so much. The history of the revival of this line of production in Great Britain, may be said to commence with about the latter half of the present century, and through the efforts of Mr. Minton a success was achieved of which all English-speaking people should be justly proud.

The branch of architectural pottery, which rightly claims a large share of attention at the present time is that of terra-cotta. In England, the friezes, cornices and other highly-ornamented work in terra-cotta of the Manor House at Barsham, and the Parsonage House at Great Snoring, both in Norfolk, erected during the reign of Henry VIII are worthy of particular notice, and the use of terra-cotta for decorative panels and bas-reliefs, appears to have been popular during his time. The gateway of York Palace, Whitehall, designed by Holbein, was decorated by four circular terra-cotta panels which are still preserved at Hadfield, Peveral, Hants. The gateway of the rectory of Hadleigh Church, Suffolk, erected at the close of the fifteenth century was very carefully restored about forty years ago; the terra-cotta for the purpose being creditably reproduced at the kilns near Hadleigh. From the latter part of the fifteenth century until after the reign of Elizabeth, terra-cotta was used only in large

and expensive buildings, but at the beginning of the eighteenth century the use of terra-cotta was by no means uncommon in Great Britain, but soon after the reign of Queen Anne its use was discontinued.

The writer a short time since was particularly pleased with the fine effect produced by the terra-cotta reredos executed by Mr. George Tinworth, under the direction of the late George Edmund Street, for York Cathedral. This work represents the Crucifixion at the moment of the erection of the cross, the soldiers being engaged in raising it into an upright position. At the foot of the cross is a group of soldiers casting lots for the vesture of the Lord; on the left appear the Virgin Mary and the Apostle John, and a little lower Mary Magdalen; the Apostle Peter is also introduced standing behind a tree; one of the malefactors is in the act of being fixed upon the cross, and is receiving the usual stupefying draught. The centurion is shown on horseback with other officers standing by; on the right, the other malefactor is represented upon a cross, and the sentinel is standing by in an attitude of adoration; the vessel is placed in front containing vinegar which a boy is tasting. Jews are standing by mocking the Saviour; a negro appears in this part of the panel looking up at Christ, the spectators in the background are in confusion, and the Roman soldiers are endeavoring to restrain them.

One of the first objects which now meets the visitor's gaze as he enters the Architectural Court of South Kensington Museum is a large terra-cotta panel by Mr. Tinworth, which is entitled "The Release of Barabbas." [See Illustrations.] In this panel, Pilate, who occupies the centre of the piece is pronouncing sentence on our Lord, who is delivered to be crucified, and is being led away bound by the soldiers in attendance; directly behind the Saviour the Virgin Mary and the Apostle John appear as spectators, together with some of their friends; a Roman officer is speaking to another spectator on the left of St. John, and on the extreme right the Apostle Peter in an agony of remorse is restrained from approaching the Lord by another soldier. On the right and left of Pilate are attendants holding water and towels that he may wash his hands, and so disown complicity in the guilt of what he has done; while Pilate's wife, with a Roman companion stands behind. On the left Barabbas is released amid the congratulations of the bystanders, and the persons of various nationalities appear in the background. To the left is a Roman watchman denoted by the bells upon his dress, and a negro is attempting to speak to Christ, and is addressing a soldier with a view of obtaining the desired interview. The place of the trial is set forth by the architectural embellishments in the background, and a broken vessel and a fallen capital in front are introduced as symbolizing the decay of the old dispensation; a palm branch is lying on the ground recalling to memory the recent triumphal entry of the Lord into Jerusalem. Allusions are made to the following texts: Acts iv: 27, 28; Gen. i: 20; Matt. xxvii: 24; Psalms cxli: 6; Cor. ii: 2; Eccles. viii: 12, 13.

Directly behind the terra-cotta panel which has just been described there is another of equal size, entitled "Preparing for the Cross." The time selected for illustration is that immediately before the crucifixion, the necessary preparations being almost completed. The Saviour stands in the centre, his eyes are closed as if in prayer, the soldiers divest him of his clothing; Simon the Cyrenian is kneeling before the Lord in worship, having assisted in bearing the cross to the place of crucifixion; on the right a soldier holds the writing which is to surmount the cross, and also the cup containing the draught which is provided for the Saviour; further to the right soldiers are binding one of the thieves; the wife of this malefactor with her infant appears just behind on the left; in front, the soldier who has been digging the hole to receive the cross is resting against a beam, and is regarding the Lord with sympathetic interest. The centurion in charge of the crucifixion is speaking to the Apostle John who stands behind accompanied by the Virgin, her sister and Mary Magdalen. Still further to the left are soldiers preparing the second malefactor for execution, this man having received the draught usually administered appears to be stupefied from its effects, his parents attend in the background. In this part of the panel are seen Nicodemus and Joseph of Arimathea together with mounted Roman soldiers, a woman is represented extending her lifeless child towards the Lord in the hope that it may be restored to life; the Apostle Peter appears in the attitude of repentance just behind a soldier who is pushing back the crowd, and close to a Jew is pointing to the Roman banner in the spirit of the words, "We have no king but Cæsar;" another Jew is engaged in conversation with a soldier who holds the inscription; the crowd behind is kept back on all points by soldiers acting under the direction of the centurion in command.

The examples which we have just described are fine specimens of terra-cotta in high relief, other specimens of Mr. Tinworth's execution of terra-cotta, but in low relief were viewed by the writer with much pleasure at the pottery of Messrs. Doulton & Co., at Lambeth, and we have selected for illustration one of his works of this character [see Illustrations] the subject being suggested by a poem of Mr. Edmund Gosse.

> "Hear me! and grant for these my pious sons
> Who saw my tears, and wound their tender arms
> Around me, and kissed me calm, and since no steer
> Staid in the byre, dragged out the chariot old
> And wore themselves the galling yoke, and brought
> Their mother to the feast of her desire;
> Grant them, O Hera, thy best gift of gifts."

This poem is founded on the legend of Cydippe, the priestess of Juno at Argos, who, on one occasion wishing to repair to the temple of the goddess, could not procure oxen to draw her chariot; her two sons Cleobis and Biton consequently put themselves under the yoke and drew her to the temple, amidst the acclamations of the multitude, who congratulated the mother on the filial affection of her sons. Cydippe entreated the goddess Juno to reward them for their piety with the best gift that could be granted to mortals. They immediately fell asleep and woke no more; the goddess thus showed that the gift of gifts is death.

Mr. Henry Doulton, of Lambeth, about the year 1870 introduced into his works (previously confined to the manufacture of drain-pipes and other rough ware, most of it salt-glazed stoneware), an entirely new class of pottery of high quality, not merely as to fabric but in its artistic excellence; it may be said to have been founded in a measure upon the German stonewares, but it possesses merits as to color, form and decoration, which are entirely original. Some of the artists who designed it such as Mr. George Tinworth, whom we have mentioned, and Miss Anna B. Barlow, have acquired a high reputation.

The architectural pottery known as "Doulton Ware" is completed in one burning, the forms being decorated in a soft state, and the colors applied as soon as the article is dry. The colors are developed in the process of firing by means of fumes of salt which are thrown into various parts of the kiln while the ware is at a white heat. The fact that the ware is unprotected in the kiln, from the smoke and sulphur rising from the fuel, and that the material is brought to the vitrifying point makes the proper application of the glaze a difficult feat.

The methods of treatment for "Doulton Ware" include incising, modelling, *appliqué*, carving, etching, *pâte sur pâte*, *repoussée* work, etc.

The favor with which the various products of the Lambeth Art Potteries have been received by art critics and the public has given an important impetus to female employment. Between two and three hundred lady artists and assistants are now occupied entirely on the work, all of whom have been specially trained for their respective branches, and have also graduated in the various classes connected with the Lambeth School of Art, or other schools connected with the South Kensington Art Department.

"Doulton Ware" is employed largely for architectural purposes not only in London, but also in other portions of Great Britain, the Colonies and in India. Glazed terra-cotta and fire clay are also produced at the Lambeth potteries: these materials which are now extensively manufactured, are chiefly employed for decorating stoves, fireplaces, grills, mantel-pieces and other large work, and lend themselves admirably to interior architectural treatment.

CHARLES T. DAVIS.

THE ILLUSTRATIONS.

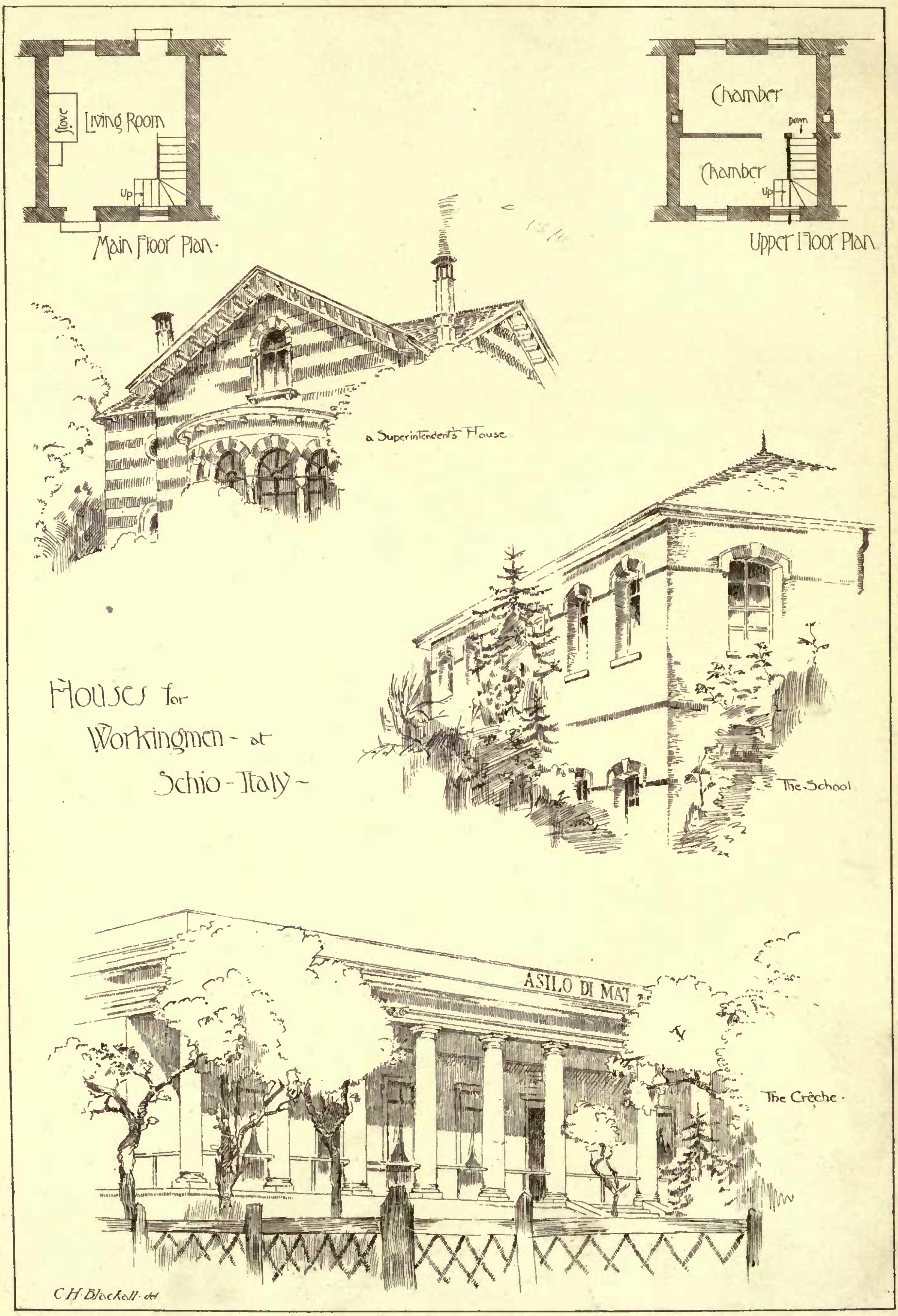
[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

TERRA-COTTA BAS-RELIEFS, BY MR. GEORGE TINWORTH, SCULPTOR.

A DESCRIPTION of these panels may be found in the preceding article on "English Pottery." As for the sculptor himself, it may be said that two years ago an exhibition was opened in London of works in terra-cotta by George Tinworth, which at once revealed to Englishmen a sculptor of marked originality and power. Mr. Ruskin's praise was not wanting, and it described the genius of Tinworth as "full of fire and zealous faculty, breaking its way through all conventionalism to such truth as it can conceive."

The sculptor was previously but little known, although he had occasionally sent some of his panels to the Royal Academy. He was born in 1844, and was the son of a wheelwright, whose trade he followed and who treated his first attempts at modelling very harshly, and reviled him for "wasting his time" on them. But he had a mother who encouraged his love for art, and fostered in him a strong predilection for religious themes. Working by day at his trade, at night he studied at the Lambeth Art Schools under Mr. Sparkes, and later entered the Schools of the Royal Academy. Here in 1865, he won the second silver medal, and in 1867 the first in the antique school. He first appeared at the Royal Academy in 1866, with a group in plaster, called "Peace and Wrath in Low Life." In the following year, his father being dead, Mr. Sparkes introduced him to Henry Doulton, the head of the Lambeth potteries, with whom he has ever since remained, moulding in clay those scenes from Bible history which have chiefly given him his fame. Tinworth is, in the common meaning of the phrase, "an uneducated man," but there is one book with which he is thoroughly familiar, and that is the Bible. Most of his works are inspired by the events narrated therein, and his best achievements have represented such events. He is sincerely pious without being bigoted, and is an unspoiled, honest workman. In his sculpture he is strongly realistic, and free from all artificial graces, telling the story in a direct and truthful way, and with energy and passion. He is fond of using many accessories, and introducing common incidents; but never suffers them to obscure his central idea.

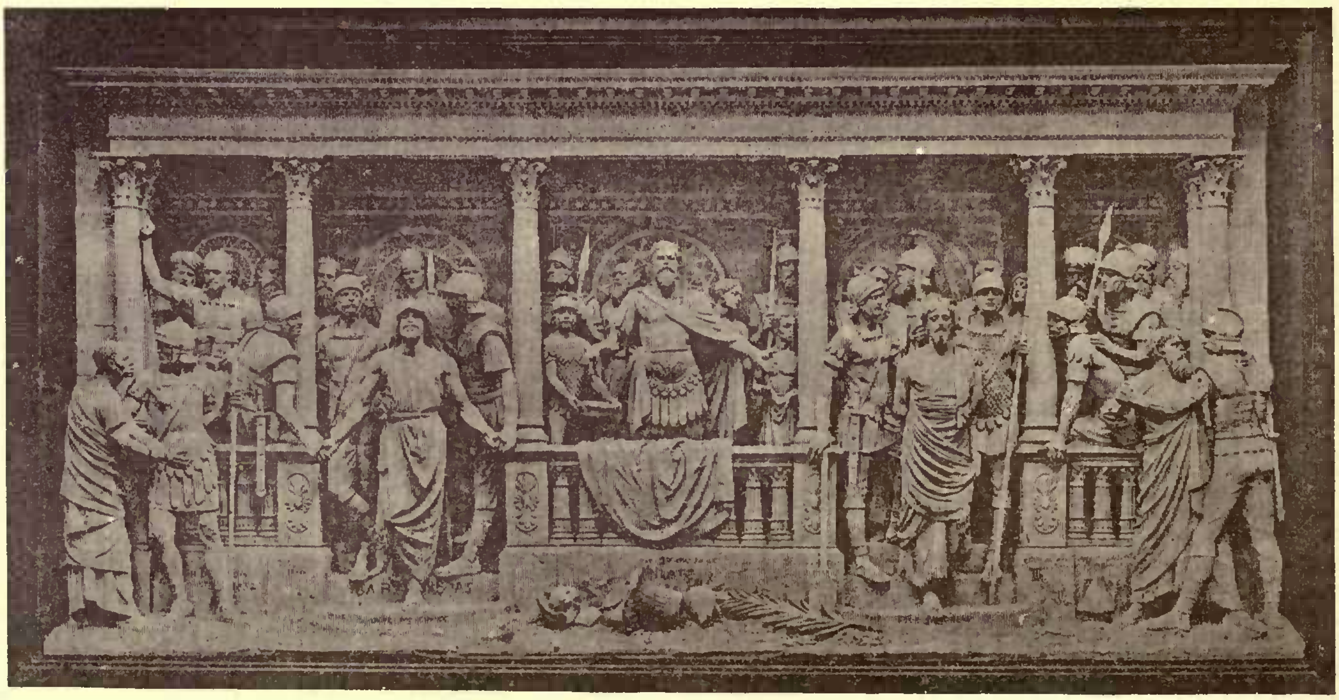
His most important works are the panels done for the reredos of



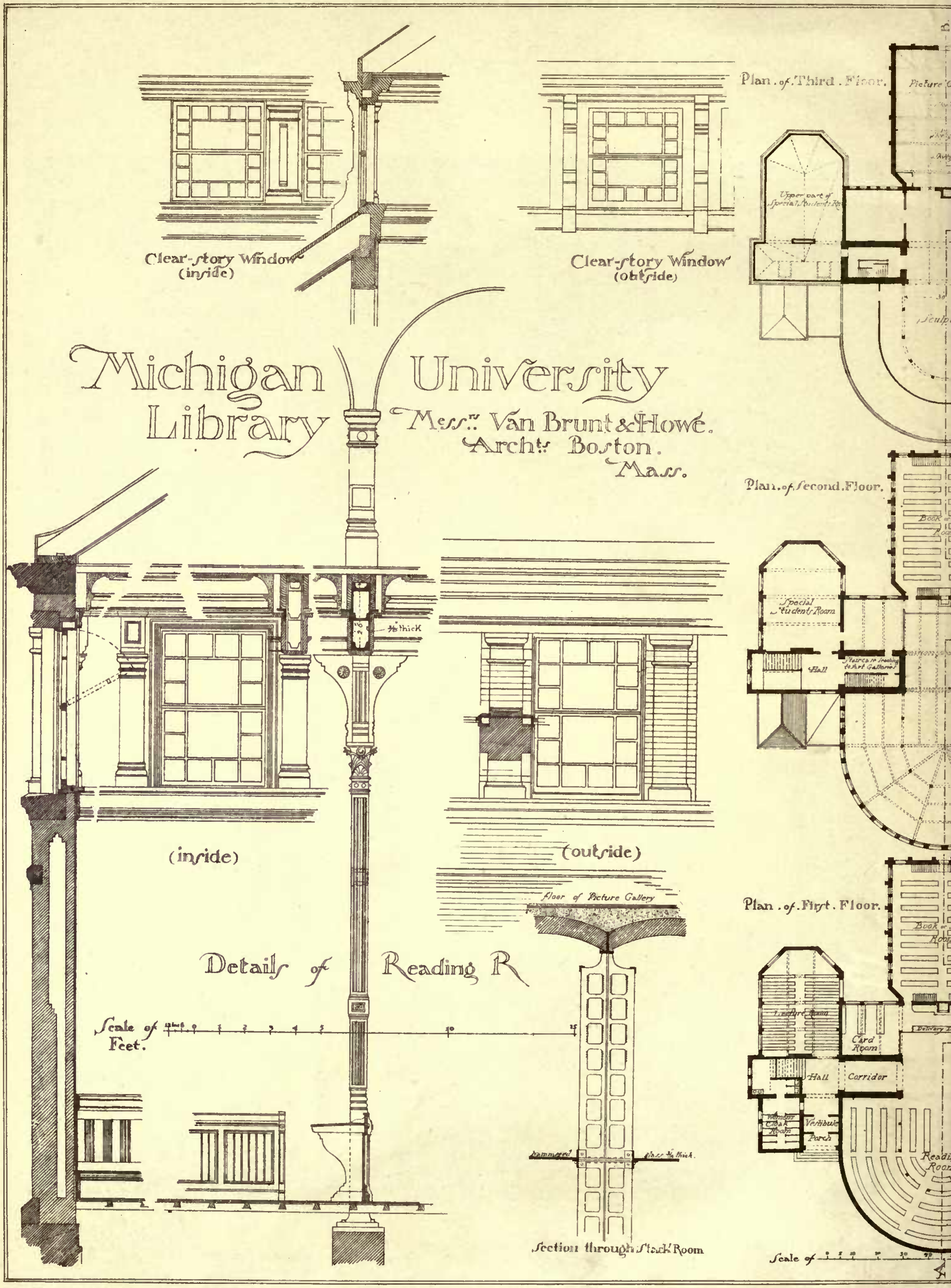
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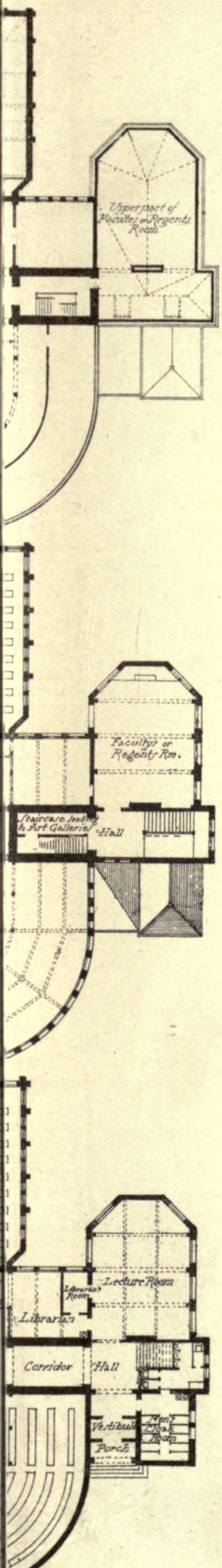
The Sons of Cydippe, ~ G. Tinworth. Sculptor.

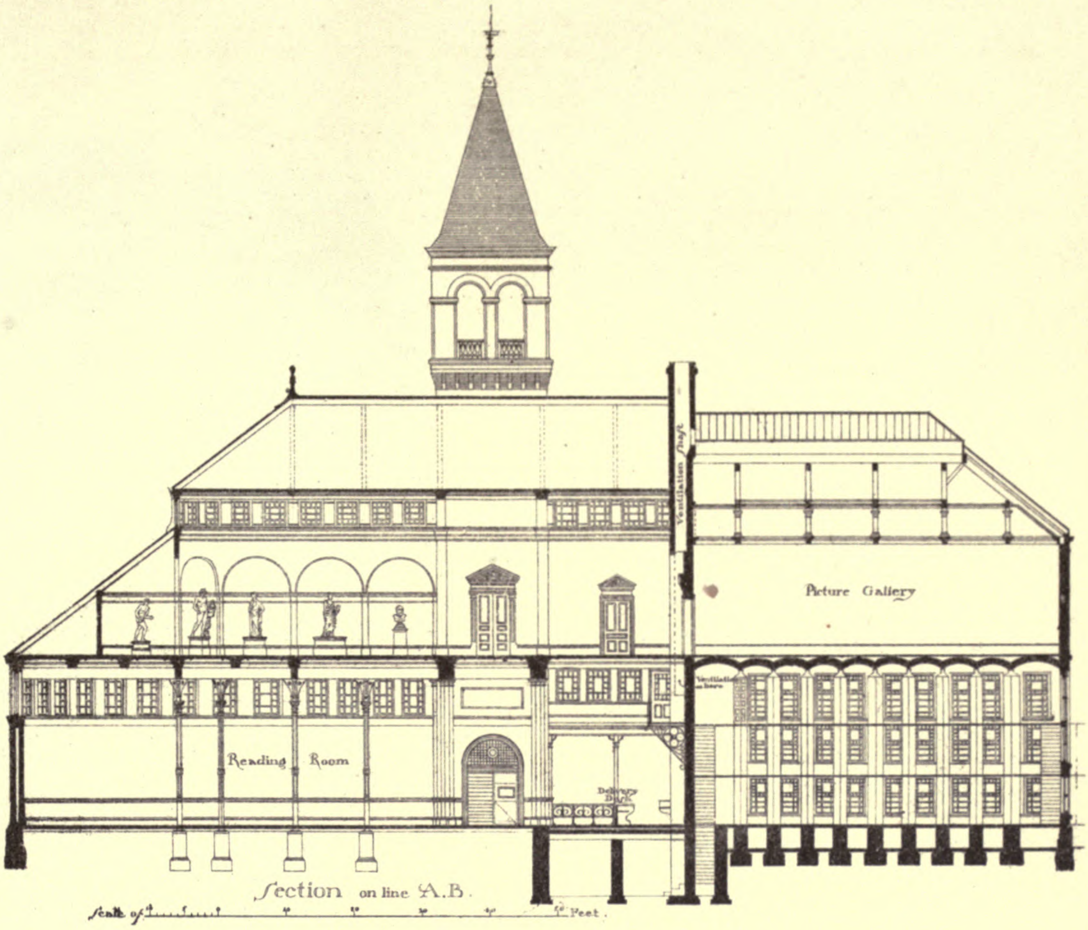


The Release of Barabbas, ~ G. Tinworth Sculptor.


Clear-story Window (inside)
Clear-story Window (outside)
Plan. of. Third. Floor.
Upper part of Special Students Rm
Michigan University Library
Mess.rs Van Brunt & Howe. Arch.ts Boston. Mass.
Plan. of. Second. Floor.
Special Students Room
Hall
½ thick
(inside)
(outside)
Floor of Picture Gallery
Plan. of. First. Floor.
Details of Reading R
Scale of Feet.
Card Room
Hall
Corridor
Vestibule
Porch
Section through Stack Room
Scale of

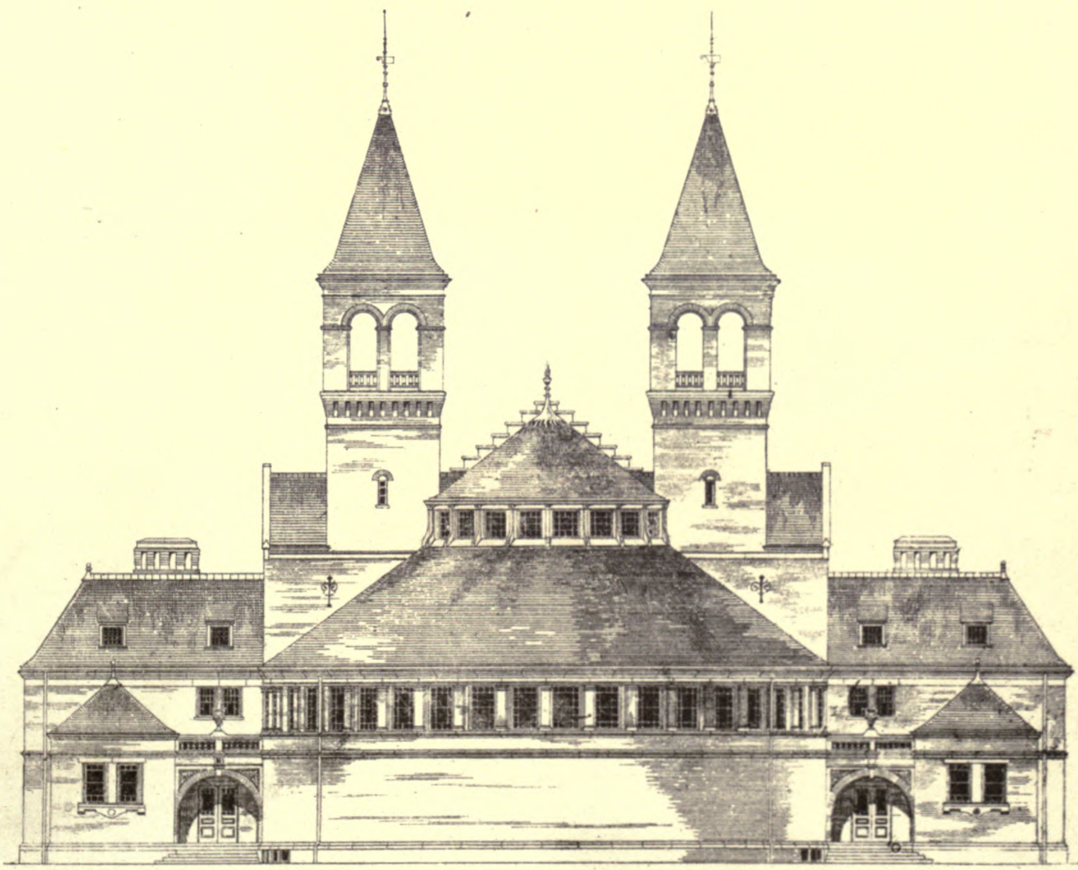
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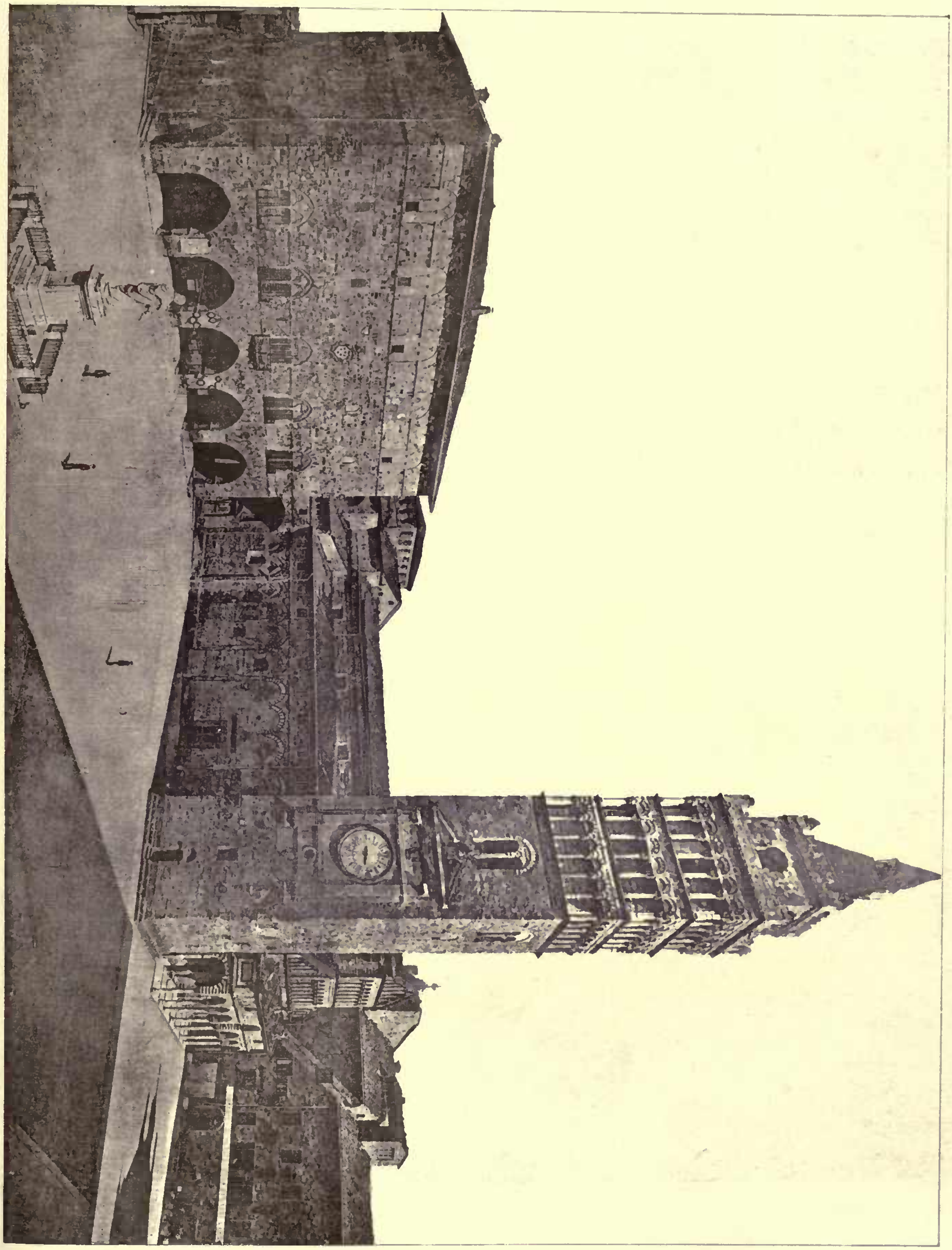
Section on line A.B.

Scale of Feet



Front Elevation

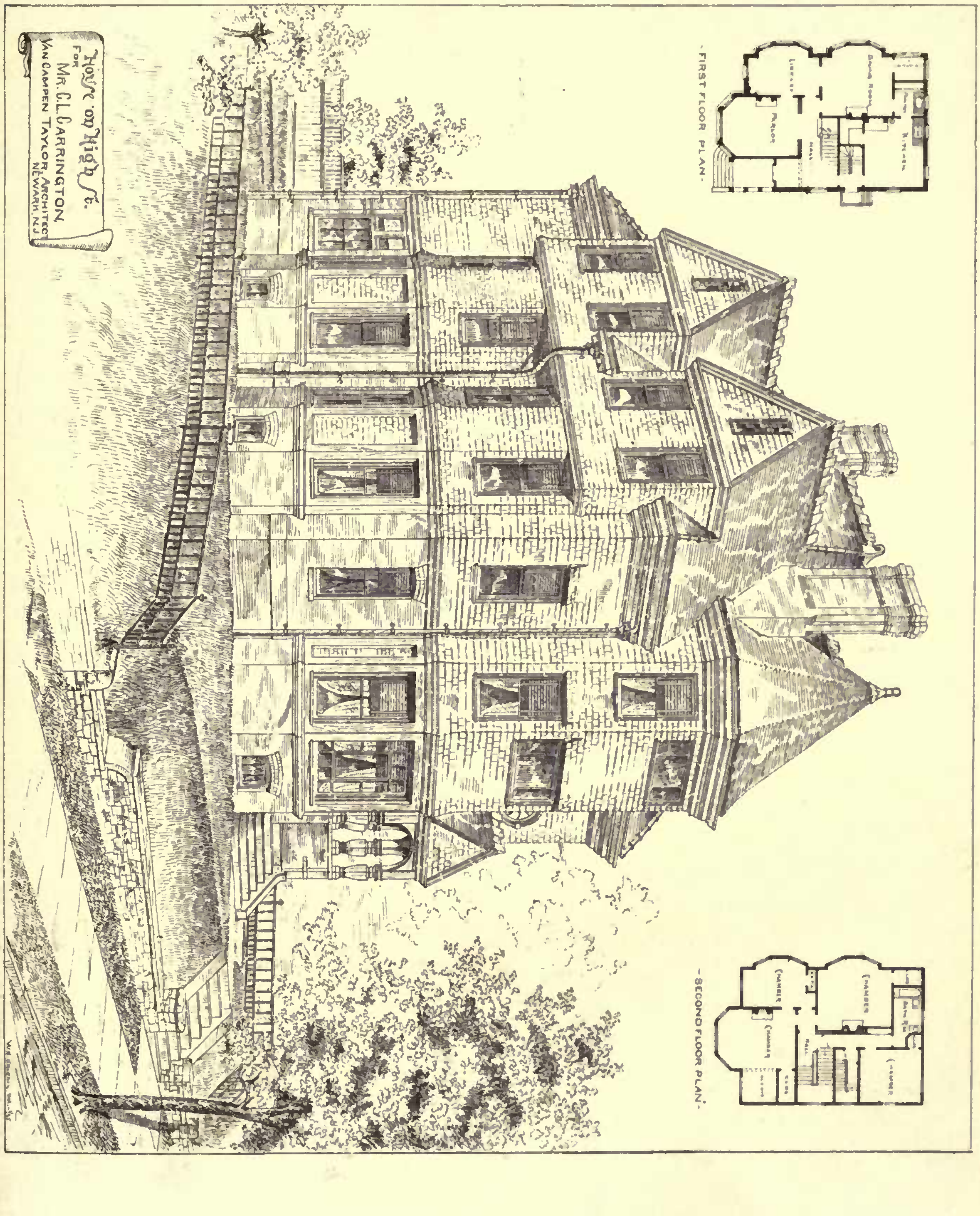
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Plaza of the Cathedral, Pistoja, Italy.

HELIOTYPE PRINTING CO BOSTON

American Architect and Building News, Aug. 1, 1885 No. 501.



York Minster, under the supervision of the late G. E. Street, and for the Guards Chapel. These comprise many Scriptural episodes, the most prominent being "The Entry into Jerusalem," "The Judgment of Pilate," "Preparing for the Crucifixion," and "The Descent from the Cross." Others are "The Distress of Herod," "The Remorse of Judas," "The City of Refuge," "The Last Supper," "The Raising of Lazarus," "The Taking of Samson," and "The Denial of Peter."

The few secular works which he has shown include a large fountain (and every group on this is a Scripture subject having some reference to water), an illustration of E. W. Gosse's poem, "The Sons of Cydippe," "A Football Scrimmage," and "The Wheelwright Shop," the last containing a portrait of himself carving in the shop when a boy.

THE PIAZZA DEL DUOMO, PISTOJA, ITALY.

PISTOJA is an ancient town of 13,500 inhabitants, situated among the mountains twenty-one miles northwest of Florence. During the Middle Ages it was the centre of the fiercest struggles between the Guelphs and Ghibellines, and in the history of art, the town which somewhat resembles Florence in miniature held an important rank, and was foremost among the Tuscan republics in fostering artistic progress. At Pistoja are found some of the earliest attempts at sculpture in Tuscany. After the fourteenth century, the town became dependent on Florence, both politically and in the province of art.

The Cathedral of San Jacobo was built in the twelfth century, and remodeled in the thirteenth. The exterior possesses little of interest except the bas-relief over the door by Andrea della Robbia, and the ornamentation of the vaulting by Luca della Robbia. The interior was restored in 1838, and whatever merit it once possessed was totally obliterated. The campanile was originally a fortified tower, called the Torre del Podestà, and still bears the arms of the Pistojan governors. The three series of arches at the top were added in imitation of the Pisa cathedral when the tower was adapted to its present purpose.

Opposite the cathedral is the Baptistery, an octagonal structure erected in 1339, after a design by Andrea Pisano. Opposite at the left of the view shown in the photo-print is the Palazzo dell Commune, erected in 1294–1385.

LIBRARY OF UNIVERSITY OF MICHIGAN. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, BOSTON, MASS.

THIS building was completed in 1883. It is constructed of brick. The book-stack is fire-proof, and the rest of the building is protected from fire by mill flooring and other devices. There is no furring. The main point in the designing of this plan was to place the delivery-desk in such position as to have immediate communication by lift and otherwise with the book-stack, and at the same time to command all the reading-room floor. The book-stacking differs from that devised by the same architects for the library of Harvard College, in having the floors of North River slabs, or of glass instead of iron grating. The stacks are three feet apart instead of two feet ten inches, as in the Harvard example. The heating and ventilation have proved successful, and the building in all its parts has given great satisfaction to the authorities. The upper floor contains a gallery of fine arts.

HOUSE FOR MR. CHARLES L. CARRINGTON, HIGH ST., NEAR CLINTON AVE., NEWARK, N. J. MR. VAN CAMPEN TAYLOR, ARCHITECT, NEWARK, N. J.

THE house is now in course of erection on one of the principal residence streets of the city. The first story will be built of North River brick, laid in red mortar, with Belleville stone trimmings. The second story, etc., will be of frame shingled with cedar shingles. The roof will be slated. The interior will be finished with painted walls, tiled fire-places, and hard-wood stairs and mantels. The cost will be about $12,000.

WORKMEN'S HOUSES, SCHIO, ITALY.

FOR description, see article elsewhere in this issue.

THE EDINBURGH VEGETABLE MARKET.



VIEW OF THE EDINBURGH VEGETABLE MARKET.

SEVERAL years ago, before it was decided whether or not what is now Copley Square, Boston, should become a public square or should be absorbed as ordinary building sites, Mr. Edward Atkinson, perceiving the desirability of ensuring that if any buildings should be placed therein they should at least be as low as possible, bethought him of the new Vegetable Market at Edinburgh, and the inquiries he made resulted in the procurement of the following information: —

EDINBURGH, November 28, 1878.

PROFESSOR JENKIN: —

Dear Sir, — The Lord Provost has handed me your note of yesterday, enclosing letter from Mr. Atkinson, of Boston, asking information as to the roof of the Vegetable Market of which I was architect.

In reply to Mr. Atkinson's question as to how to procure plans, etc., I may state that there are no drawings of this structure but my working plans. But this building is very peculiarly situated, and I think it somewhat doubtful how far such plans would be of use to him. I therefore beg to enclose a general description and rough sketch, to which Mr. Atkinson is welcome, and if, judging from these, he still thinks that drawings would be of use to him, I shall be happy to provide copies.

There are no photographs extant. The enclosed small engraving, made for the tenant of a portion of the building, may, however, help to convey an idea.

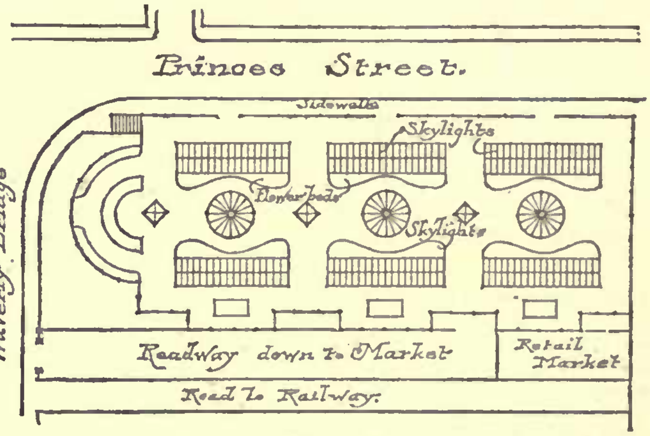
Yours faithfully,
R. MORHAN.

DESCRIPTION OF THE EDINBURGH VEGETABLE MARKET.

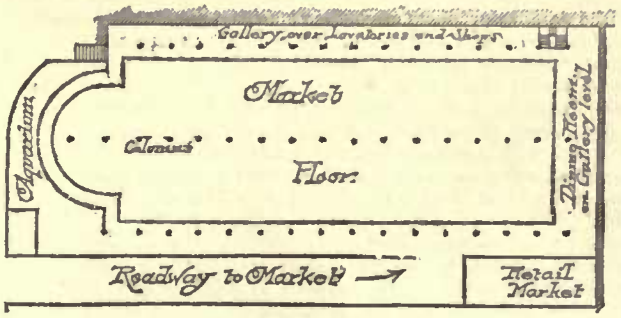
This building, which is about four hundred feet long and one hundred and fifty feet wide, adjoins Princes Street, the leading thoroughfare of the city, near its eastern extremity. The floor of the



market is twenty-eight feet below the street level, and no part of the structure is higher than the street level. This restriction in the height is enforced by the rights of proprietors on the opposite side of the street. The necessity for restricting the elevation of the structure within this limit, and at the same time (owing to its proximity to so important a thoroughfare) the desirableness of a somewhat more sightly structure than a commonplace roof, suggested to the architect the form of roof eventually adopted: namely, a level platform entering directly from the street, having large glazed open-



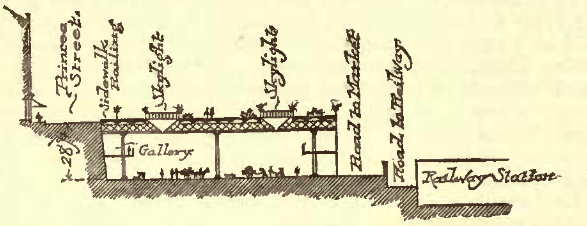
ings at regular intervals for lighting the market below, and ornamental railings, pedestals and vases surrounding the general platform and the said openings, and further decorated with flower borders and plats. In summer these vases and plats are stocked with a great variety of plants which are removed in winter, but some parts are kept in grass all through the winter without trouble. Though nominally a garden, the greater portion of the roof consists of promenade space and of the large openings above mentioned, the floral decorations forming a trimming to these more utilitarian parts. The general surface is formed of asphalt, on brick arching and concrete, resting on iron bearers, which again rest on main girders spanning the whole width of the market-house, with a rest at the middle on a



row of iron columns running along the centre of the building. These columns rest on piles, some of which are driven thirty feet into the ground. From the nature of the situation there is no elevation towards Princes Street, but on the opposite side, and on a great portion of the ends there is an arcaded façade, in cast-iron and glass,

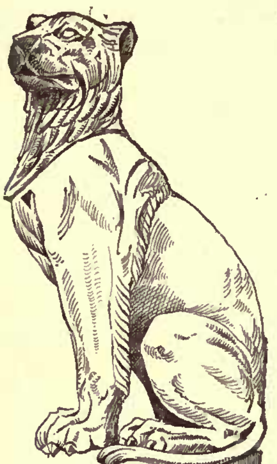
affording, with the roof-lights before mentioned, abundant light for the interior of the market. The floor of the market is paved with asphalt.

The top of the building is fitted with hydrants and hose for watering the flower-beds, and the interior with fire-plugs and hydrants for



cleansing. The market being a wholesale one, where the market-gardeners bring their carts with produce, it was desired to have as few obstructions in the general area as possible; hence the long span adopted for the main girders. The interior is fitted up for lighting by gas, but it is at present in contemplation to introduce the electric light.

TALL CHIMNEY CONSTRUCTION.[1] — III.



PANTHER — Between Dormers Nat. Hist. Museum, London, Eng. A. Waterhouse, A.R.A. Archt.

WROUGHT-IRON CHIMNEY. — MESSRS. SCHNEIDER'S CREUSOT WORKS.

	ft.	in.
Height above ground	279	0
Diameter at the top	7	6½
" " base	22	11½
Weight, 80 tons.		

Its dimensions, therefore, obviously precluded its being raised in a single piece without the employment of appliances which were considered inadmissible; under these circumstances, it was decided to erect the chimney in parts, without the use of any fixed scaffolding whatever.

The chimney, of which we have already given the principal dimensions, is founded on a mass of masonry rising about three feet three inches above the level of the ground, and weighing about three hundred tons; the base of the structure — which is spread — being fixed to this masonry by a very strong angle-iron ring riveted to the chimney-plates, and secured to the foundation by holding-down bolts.

The chimney, properly so called, is composed of rings four feet one inch in height, the plates varying from 0.552 inches thick at the base, to 0.275 inches thick at the summit. At the ninth ring the circumference is made up of eight plates, while at the upper part the rings are each composed of four plates only. To protect the plates from the heat arising from the combustion of the gas, and to prevent the lower rings from being injured, an inner shaft of fire-brick is carried up within the iron casing for the height of eight rings.

CHIMNEY-STACK AT THE WEST CUMBERLAND HEMATITE IRON WORKS.

Engineer, the late Professor Macquorn Rankine.

This chimney represents nothing new in design or construction, and is not of any extraordinary size or figure; but as it is a successful example of the application of correct principles and good workmanship to a structure of a useful and ordinary kind, the publication of an account of it may prove serviceable.

Duty. — The duty which this chimney has to perform is to carry off the gaseous products of combustion from four blast-furnaces, and from various stoves and boilers that are heated partly by burning the inflammable gas from the blast-furnaces, and partly by coal. The total quantity of solid fuel consumed may be estimated at about ten and one-quarter tons per hour when all the furnaces are at work.

Figure and Dimensions. — Above ground the chimney is a frustum of a cone with a straight batter. Underground there is a plinth or basement, octagonal outside at the ground line and square at the bottom; cylindrical inside and pierced with four circular openings for flues. The reason for adopting a straight batter, notwithstanding that a curved batter enables certain theoretical conditions to be more perfectly fulfilled, is that the accuracy of building with a straight batter can be tested at any moment by a glance of the eye without the aid of instruments. The principal dimensions are as follows: — Height above the ground line, two hundred and fifty feet; depth of foundation below the ground line (including a layer of concrete three feet deep), seventeen feet; total height from foundation to top, two hundred and sixty-seven feet. Inside diameter at top of cone, thirteen feet, inside diameter at two feet above bottom of cone, twenty-one feet, ten inches; inside diameter in basement, eighteen feet, ten inches; inside diameter of archways for flues, seven feet, six inches; outside diameter at top of cone, fifteen feet three inches, outside diameter at two feet above bottom of cone, twenty-five feet, seven inches; outside dimensions of square basement, thirty feet by thirty feet; outside dimensions of foundation course, thirty-one feet, six inches by thirty-one feet, six inches; outside dimensions of concrete foundations thirty-four feet six inches by thirty-four feet, six inches. The change from the square to the octagonal shape in the basement is made gradually by stepping the brickwork at the corners.

Thickness of Brickwork, Stability and Load. — It had previously been ascertained by observation of the success and failure of actual chimneys, and especially of those which respectively stood and fell during the violent storms of 1856, that in order that a round chimney in this country may be sufficiently stable, its weight should be such that a pressure of wind of about fifty-five pounds per square foot of a plane surface directly facing the wind, or twenty-seven and one-half pounds per square foot of the plane projection of a cylindrical surface — that is to say, a pressure equivalent to the weight of a layer of brickwork three inches deep, and of an area equal to the vertical section of a round chimney — shall not cause the resultant pressure at any bed-joint to deviate from the axis of the chimney by more than one-quarter of the outside diameter at that joint.[2]

By calculating according to that principle, the thickness of brickwork in the cone was determined to be as follows: — Uppermost eighty feet of height, one and one-half bricks; next eighty feet of height, two bricks; next eighty-eight feet of height, two and one-half bricks; lowest two feet of height, increasing by steps from two and one-half bricks to four bricks, in order to spread the pressure on the basement.

The bed-joint of least stability is two feet above the ground line, and the deviation of the resultant pressure from the axis of the chimney at that joint, which would be produced by such a wind as has been mentioned is six feet, four inches, being a fraction of an inch less than one-quarter of the outside diameter. The thickness of the arching in the openings for flues is three bricks. The following are the intensities of the mean pressures due to the load on different bed-joints: — At two feet above the ground line eight tons on the square foot; in basement at the springing of the arches three tons on the square foot; on the upper surface of the concrete two tons on the square foot; on the ground below one and six-tenths tons on the square foot.

Fire-brick Lining. — The thickness of brickwork already stated, include the fire-brick lining, whose thicknesses are as follows: — In the uppermost one hundred and sixty feet of the cone, one-half brick; in the lower part of the cone, the basement and the flue archways, one brick. The fire-brick lining is bonded with the common brickwork in the ordinary way, the only difference being that the fire-bricks are laid in fire-clay, and the common bricks in mortar. The reasons for adopting this mode of construction in preference to an internal fire-brick chimney are as follows: — First when the fire-bricks are bonded with the common bricks they contribute along with the common bricks to the stability of the chimney (Mr. Edwin Nash, F.R.I.B.A., says the fire-brick lining must never be considered as part of the structure), whereas, if an internal fire-brick chimney had been used, an additional thickness of common brickwork would have been required in order to give sufficient stability to the outer cone; secondly, unless the internal chimney is carried up to the top of the outer cone there is a risk of damage through the explosion of inflammable gaseous mixtures in the space between; and thirdly, under the same circumstances there is also a risk of the cracking of the outer cone at and near the upper end of the inner cone through unequal heating at that place. Vertical cracks in a chimney are the more dangerous the higher the level at which they occur, because the safety of the higher part of a chimney depends more on cohesion and less on weight, than that of the lower parts. When such cracks take place near the ground they are of little or no consequence. The basement is paved inside with six inches of fire-brick resting on six inches of common brick which rests on the concrete.

Ordinary Brickwork. — The ordinary brickwork is built of white bricks of very good quality, supplied by the Iron Company. It is built in English bond. In the basement there is one course of headers to every two courses of stretchers, in the cone one course of headers to every three courses of stretchers.

Mr. Clegg, in his "*Manufacture of Coal-Gas*" (J. Weale, 1859), page 176, says: — "At the distance of about every fifteen feet, a wrought-iron hoop two and one-half inches by one-half inch thick must be built into the brickwork as the chimney rises; this is necessary to avoid cracks."

Strips of No. 15 hoop-iron tarred and sanded, are laid in the bed joints of the cone at intervals of four feet in height, with their ends turned down into the side-joints. Care was taken to bed the hoop-iron on the common brickwork, and not on the fire-brick lining. The length of hoop-iron in each bed joint in which it is laid is twice the circumference of the chimney.

Mortar. — In the concrete foundation, the basement, and a small part of the cone the mortar was made of hydraulic lime. Owing to an unexpected difficulty in obtaining such lime on the spot, it had to

[1] A paper by R. M. Bancroft and F. J. Bancroft, read before the Civil and Mechanical Engineers' Society. Continued from page 6, No. 497.

[2] See "*Proceedings of the Philosophical Society, of Glasgow*" for 1856, page 14.

be brought from a distance at considerable expense, and therefore the mortar for the rest of the building was made of a very pure lime from the immediate neighborhood, rendered artificially hydraulic by a mixture of iron scale from the rolling-mills at the works, it having been in the first place ascertained that the supply of iron scale could be furnished to the contractor with sufficient rapidity.

The following are approximately the proportion of the ingredients of the mortar by measure: — Lime, two measures; scale, one measure; sand, five measures; total, eight measures. It is scarcely necessary to state that the use of iron scale for hardening mortar and making it artificially hydraulic is familiar to engineers, architects and builders in Glasgow and its neighborhood; but in many other parts of the country that process appears to be less known than it deserves. The principal constituents of the iron scale are probably silica and protoxide of iron; but its action upon lime, and the nature of the artificial cement which it forms, have not hitherto, so far as I know, been investigated by chemists. Considering the benefits that have arisen from the chemical analysis of other cementing materials, it is much to be wished that some chemists should undertake the examination of this material also.

Cast-Iron Curb. — Lightning Conductor. — On the top of the chimney is a pitch-coated cast-iron curb, one inch thick, coming down three inches on the outside and inside. The lightning conductor is a copper wire rope three-fourths inch in diameter. It terminates in a covered drain, in which there is always a sufficient run of water.

Scaffolding.—In the construction of the internal scaffolding care was taken that the needles or horizontal beams should be supported wholly by the brickwork, and not by the upright posts, for great danger has been known to arise from the brickwork coming to bear upon the ends of the needles, and through them, on the posts, owing to the settlement of the lower part of the chimney.

Precautions against too Rapid Building. — In order that the concrete foundation might have time to harden before being subjected to a heavy load, it was made by the Iron Company themselves before the contract for the chimney was let; for it is known that intense pressure tends to retard the hardening of concrete. The progress of the building was restricted by the specification to a rate not exceeding six feet of vertical height per day.

Contract and Execution.—Tenders were taken from a limited number of builders in the North of England and in Scotland, and the lowest offer was accepted, being that of Messrs. William Wilson and Son, of Glasgow. The work was executed by that firm in a manner that left nothing to be desired.

Cost.—The following were the amounts of the estimated and actual cost respectively: — Engineer's approximate estimate, £1,672; actual cost including designing and superintendence, £1,560; being at the rate of almost exactly 4*d.* per cubic foot of the whole space occupied by the building, which is 94,000 cubic feet nearly.

Present Temperature and Draught.—According to the last account, the temperature inside the chimney when doing about three-fourths of its full duty is 490° Fahrenheit, and the pressure of the draught is one and seven-eighths inches of water, which agrees to a very small fraction with the pressure as deduced theoretically from the temperature and the height of the chimney.

Comparison with some other Chimneys. — The dimensions and stability of the chimney which has just been described are nearly the same with those of the second highest chimney at St. Rollox Chemical Works, built about ten years previously, except that in the older chimney the joint of least stability is one hundred feet above the ground. In the great St. Rollox chimney, four hundred and fifty-five and one-half feet high from foundation to top, the greatest pressure of wind which can safely be borne is almost exactly the same, viz., fifty-five pounds per square foot of a plane surface, or about twenty-seven and one-half pounds per square foot of the plane projection of a cylindrical surface. The bed-joint of least stability is two hundred and ten feet above ground. In the great Port Dundas chimney, four hundred and sixty-eight feet high from foundation to top, the bed-joint of least stability is two hundred feet above the ground, and the greatest safe pressure or wind is sixty-seven pounds per square foot of a plane surface, or thirty-three and one-half pounds per square foot of the plane projection of a cylindrical surface; so that here it may be considered that there is an excess of stability.

CHIMNEY-SHAFT AT WOOLWICH ARSENAL.

Concrete foundation.	ft.	in.
Height from foundation to top	239	9
" ground "	223	9

Base above ground line 20 feet square.

The plinth and cornice stand twenty-seven feet high, above which the octagonal shaft commences.

	ft.	in.		ft.	in.	
Shaft	16	9	diameter at bottom by	2	7½	walls
"	6	6	" top "	0	9	"

The brickwork is reduced four and one-half inches at every thirty-one feet, six inches, the topmost length being twenty-six feet.

It is all built in mortar, except the top nine feet, which is bell-mouthed, and built in cement, and is finished with a Portland stone cap and blocking, weighing about seventeen tons.

Time occupied in building from laying the first brick to the laying the last stone at top was nineteen weeks.

MESSRS. GOSLING'S NORTHFLEET SHAFT.

	ft.	in.
Height from foundations to top	227	0
" " ground "	220	0
Outside diameter at base	30	0
" " ground line	22	0
Inside " "	14	6
Outside " top	11	0

Inside diameter at top nine feet six inches, diameter reduced at four feet seven and one-half inches from top to eight feet, nine inches.

The rate of progress in building was under fifteen feet, or two feet six inches per working day.

Principal part of the bricks were Rutter's paviors, or best picked stocks.

The best Dorking gray stone lime, with the best Thames sand, every few courses being grouted in with Portland cement.

Part of this shaft fell in October, 1873, and was rebuilt and finished by August, 1874. Special precautions were taken in rebuilding that all bricks should be wetted before being laid.

WROUGHT-IRON CHIMNEY, MESSRS. SCHNEIDER AND COMPANY, CREUSOT WORKS.

	ft.	in
Height	197	0
Diameter at top	4	3
" " of carved base	6	7

Diameter ten feet, increased at bottom by a carved base.

Weight, forty tons.

The thickness of the sheet-iron is three thirty-seconds of an inch at the top, and seven-sixteenths of an inch at the bottom.

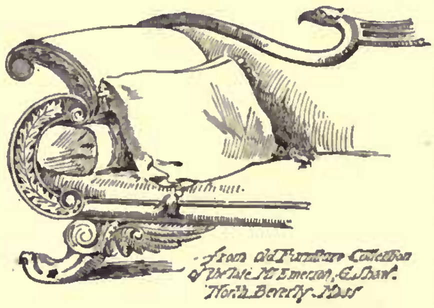
It has an inside ladder — was riveted together horizontally, and lifted afterwards with a crane.

WROUGHT-IRON CHIMNEY, PITTSBURGH.

	ft.	in.
Height	196	0
Diameter	6	7

This was riveted together horizontally and then lifted to the perpendicular by a crane.

FIXING THE BLOWING SANDS ON THE LANDES OF GASCONY.



When we think of the aspect of the Landes of the south of France, our mind sways between two images, one, the aspect of the Landes a hundred years ago, when they were a mere barren waste of shifting sand, that was daily invading the cultivated land in the interior, and the other, their present wooded appearance.

It was M. Bremontier, an able officer of the French Administration of Forests, who, in 1789, devised the means by which these barren, shifting sands have been fixed and converted into their present form of profitable forest. Their previous condition, as described by him, and quoted by Loudon, consisted of drifting sands, which covered three hundred square miles. The surface of this immense tract was like a sea, which, when agitated to fury by a tempest, had been suddenly fixed and changed to sand. It offered nothing to the eye but a monotonous repetition of white wavy mountains, perfectly destitute of vegetation; a multitude of round tops, some of them scooped out so as to resemble craters or semicircular mounds. In times of violent storms of wind the surface of these downs was entirely changed, what were hills of sand often becoming valleys, and the contrary. It was on these occasions that the sand was carried up into the interior of the country, covering cultivated fields, villages, and even entire forests. This used to take place so gradually (by the sand sweeping along the surface and thus raising it, or falling from the air in a shower of particles, so fine as to be scarcely perceptible), that nothing was destroyed. The sand gradually rose among the crops, as if they were inundated with water, and the herbage and tops of the trees appeared quite green and healthy, even to the moment of their being overwhelmed with the sand, which was so very fine as to resemble that often used for hour-glasses. Madame Michelet, in her work, "*Nature: or the Poetry of the Earth and Sea,*" incidentally shows that its character, in this respect, remains unchanged. She says: "The sun was already high in the heavens. Feeling somewhat fatigued, I flung myself back upon a sand-hill; nor could there be a softer bed. The sand was so fine, so mobile, that though the wind was light, it fell about me like an impalpable dust. But soon my dress was full of it, and even my hand was covered. This set me dreaming. Wherefore, oh charming Nature, do'st thou wish to

bury me? I feel myself already oppressed with the weight of this sifted sand, which thou throwest at me playfully; yet, at the same time, it seems as if it would re-awaken me to life, whether it comes from the warm sea, still impregnated with marine odors, or whether it descends from the dune, all balmy with the pollen of flowers." And she thus graphically describes the Landes from another point of view: "The moving rampart of sand, forty leagues in length, notwithstanding its mobility, seems inexorable. Not the smallest harbor exists. The great waves coming from America beat against the outline of the desolate shores. If they accumulate sand and *débris*, they do not mould them in opposition to, or in accordance with the dunes, like the ocean and the Gironde. The rivers which flow from the interior have gradually been constrained to yield to the dykes thrown across their channels. They flow parallel to the sea, in a southerly direction, so as to pour into it obliquely their dwindling waters." This is the scene as one sees it now. The river is fenced from the sea by a long bank of sand, now bearing the trees planted by Bremontier. It is an old story how he did so. The difficulty of fixing shifting sands is no new problem, and various have been the means resorted to. But none have succeeded so well as Bremontier's. He sowed on the surface of the sand, seeds of the common broom, mixed with those of pinus pinaster, or cluster pine (var. *maritima*), one of the few pines that thrive in sandy soil. He commenced on the side next the sea, or on that from which the prevailing wind blew, and sowed in narrow strips at right angles to the wind. The first strip was protected by a line of hurdles; it, in its turn, protected the second, the second the third, and so on, until the whole breadth of the downs in the locality with which he was dealing was covered with plantation. His success was complete — the barren waste of sand is now clothed with the fragrant pine. Charming open sandy spots invite the traveller to pause and take shelter from the rays of the hot sun under the thick foliage of its giant boughs. A flora of its own has supplanted the previous lifeless desolation — a flora meagre, but exquisite and rich in pungent and penetrating perfumes; vervain, mint, bindweed, marjolaine and broom are scattered around. A fauna, too, has followed in its train; crowds of insects that prey upon the pine have swarmed after it, and their hum adds to the rural charm of the scene. Everything breathes of solitude and repose; Nature herself seems asleep, but not dead. Before Bremontier, on such a day and such an hour, she might, indeed, have seemed dead; but now life is all around; man himself breaks the charm of apparent lethargy: the sound of the woodman's axe breaks upon the silence; the blue vapor of the charcoal-burner's heap ascends into the sky, and assails the nostrils. Thanks to Bremontier, man has found here, too, something for his hand to do; women and children have followed in his train, and the blowing, shifting, restless sands now yield subsistence to an industrious, though scanty population.—*M., in Woods and Forests.*

NOTES AND CLIPPINGS.

The Bower-Barff Process for Protecting Iron. — The *Engineering and Mining Journal* says that the exact extent of the value of this process remains to be proved by fuller experience, but that it may be considered as fully proved that it efficiently protects iron surfaces against ordinary atmospheric influences and a large number of weak acids and acid fumes. At a meeting of mechanical engineers in America, a Mr. Towne stated that the process did not answer on boats where exposed to salt water, which very soon attacked the metal in spite of the coating; and that when once the coating was broken through the corrosion of the metal was more rapid than on iron which had not been coated. Concerning this, the above-named journal remarks that the magnetic oxide coating *does* stand salt water perfectly, and suggests that the cases observed by Mr. Towne are due to the mechanical abrasion of the coating, owing to its being exposed to wearing. The coating stands better than paint or zinc, but of course can be broken away. As regards the assertion that once broken through, the presence of the coating causes increased corrosion, the *Journal* remarks that it can see no reason why this should be so. It is generally stated, that such increased corrosion is the case where a zinc coating is broken through, and that this is due to galvanic action. This may be also the case with the Bower-Barff coating. But more investigation is needed on this point.

Reverse Blue Prints. — The French process, brought forward by M. Pellet, for the photographic reproduction in blue lines on white paper of industrial drawings, plans, maps, etc., is thought to have some special advantages. It is based on the property of perchloride of iron being reducible to protochloride by light, the latter salt not being changed by a solution of prussiate of potash, while the former is immediately colored blue. The copying paper is sensitized by immersion in a bath formed of one hundred of water and ten of perchloride of iron, and five of oxalic acid, or other vegetable acid. The drawing, on transparent paper, is placed on a dry sheet of the copying paper, and exposed to the light under glass, that is, fifteen to thirty seconds to the sun in summer, forty to seventy seconds in winter, and in the shade, the exposure varying from two to forty seconds, according to weather. After exposure, the sheet is placed in a bath of prussiate of potash, fifteen to eighteen per cent of water, which immediately colors blue all the parts where the perchloride has remained intact, but does not affect the parts where the salt has been reduced by the light. Then the drawing is washed with water, and passed into an eight to ten per cent bath of hydrochloric acid, which removes the salt of protoxide of iron, when it is washed again and dried. The drawing now appears in deep blue tints on a very white ground, its appearance being that of a drawing made by hand with blue ink. — *Providence Journal.*

Copenhagen. — If any one expects to find the capital of Denmark a bright, gay city, with white marble palaces, magnificent residences, dazzling shops, lively streets, grand trees, imposing public buildings, stately churches, wide boulevards, sparkling with wealth and beauty, he is doomed to disappointment. Instead, he finds a commonplace city, with an excellent, though not picturesque harbor, a pleasant artificial lake in the centre of the town, and a park in the outskirts. Architecturally, Copenhagen is unimposing, dreary and dilapidated. The public buildings, with the exception of Christianborg Palace (recently destroyed by fire) are unattractive. There is an unfinished church, standing in the centre of the city, with an imposing dome, but it has stood unfinished so long that a stranger is in doubt whether it is a ruin or a building in progress of erection. The Thorwaldsen's Museum, remarkable in its collection of the works of this great modern sculptor, has the appearance of an old theatre turned inside out. The four wretched old palaces which now contain the representative of a monarchy that has celebrated the thousandth anniversary of its foundation, look with a musty, ancient, vacant stare into the most desolate cobblestone square that it is possible to picture. The yellowish-gray walls of the old buildings are peeling away; not a green leaf or blade of grass has the courage to grow within range of the front of these so-called palaces; nothing but crumbled stone, dirty white shutters, cobblestones, and a bronze statue of Frederick the something, greet the king's eye should he gaze from any of the front windows of his apartments upon the streets below. In the meantime the "good and faithful Parliament" calmly refuses to appropriate the money necessary to rebuild the Christianborg Palace. The City Exchange of Copenhagen is of red brick and sprawls over considerable ground, having the appearance of a block of Gothic cottages. The hotels and restaurants are uniformly bad. The Hotel d'Angleterre is considered the best. It is badly kept. The plaster in the bedrooms is cracked and falling off, the wall-paper mildewed with dampness and black and greasy with age and use. The sanitary arrangements are simply abominable and enough to breed infectious disease. It is difficult if not impossible to obtain a good dinner in the city. The fare at the best restaurant is poor. Copenhagen is badly drained, or rather not drained at all. —*Philadelphia Press.*

The Washington Monument and the Lightning Stroke of June 5. — The recent injury to the Washington Monument by lightning has attracted attention throughout the country to such a degree that a short statement of the facts in the case will doubtless be of interest to the readers of *Science*. On the afternoon of June 5, a thunder-storm of no unusual character passed over Washington. At about fifteen minutes past three there was a single burst of thunder of some violence, which was about the only notable electrical disturbance of the afternoon. Although it had successfully passed through disturbances apparently much more violent on one or two previous occasions, this time the monument was "struck" and some damage done to one of the stones near the apex. Two men who were inside of the structure at the base described the sound produced as resembling the simultaneous discharge of a great number of cannon, and declared that the "whole monument trembled." Two others were in a small wooden building, used as an office, near by. One of them was looking out of the window, away from the monument, toward the north. He affirms in the most positive manner that he saw a ball of fire, which he says was as large as his fist, coming directly toward the window out of which he was looking. Both he and his companion (who was not looking out of the window, and who did not see the ball of fire) seem to have felt something of the usual effect of a shock. Those who were within the monument say they felt no unusual sensations except those produced by the noise. When the monument was examined from the ground with the unaided eye, no injury could be detected. On applying a good telescope, however, it was seen that one of the stones just below the capstone was split from top to bottom, the crack produced being about four feet long, and it was open to the extent of about two inches. A small corner of the lower corresponding angle of the capstone had also been carried away, this doubtless resulting from the opening of the crack in the stone upon which it rested. Col. T. L. Casey, U. S. A., the engineer in charge of the construction of the monument, requested Professors Rowland, of Baltimore, Newcomb, of the United States Navy, and Mendenhall, of the Signal Service, to examine the monument, and recommend such additions to the present arrangements for protection from lightning as would seem to them necessary and sufficient. It was ascertained on examination that, with the exception of that referred to above, the monument showed no evidence whatever of having received the stroke. A careful examination of the tip of the aluminum apex has not yet been made; but it seems likely that it will be found to be somewhat blunted by fusion, as is often the case even where no other effect of the stroke is to be seen. The aluminum pyramid is secured to the capstone by a heavy copper bolt one-and-a-half inches in diameter. From the end of this four copper rods, each three-quarters of an inch in diameter, are carried to the extremities of four heavy iron columns extending to the base of the monument, inside of which the elevator runs. As originally put in, these rods are bent out towards the four corners of the pyramid near which they run on their way to these iron columns. Just where one of these is nearest to the angle of the pyramid, and hence nearest to the outside of the structure, the rupture occurred; and to this must doubtless be attributed the localization of the stroke. The damage done to the monument is in reality very small, and can easily be repaired; but the accident is exceeding instructive to those interested in lightning protection. The conducting power of the interior seems to be ample for any discharge which could possibly occur, and no evidence appears of any weakness in this respect; but it is evident that the aluminum apex alone does not possess sufficient collective or distributing power, and the improvements suggested by the Committee will doubtless be in the direction of increasing that power by the addition of more metal. — *Science.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

321,936. COMBINED SCREEN AND STORM DOOR. — Charles Anderson, Downer's Grove, Ill.

321,939. SELF-SUPPORTING STRUCTURE. — Daniel Bates, Coldwater, Mich.

321,949. DOOR-SPRING.—Arthur Carrier, Bay City, Mich.

321,964. COMBINED DOOR-CHECK AND BUFFER. — Carrie G. Griffin, Manhattan, Kans.

321,973. SEWER-GAS VALVE. — Frank G. Johnson, New York, N. Y.

321,974. SEWER-GAS CUT-OFF FOR BASINS.—Frank G. Johnson, New York, N. Y.

321,994. SASH-BALANCE.—William S. Michael and David W. Gelb, Lancaster, Pa.

321,995. VISE.—Peter Minea, St. Paul, Minn.

322,006. CONCRETE-MIXING MACHINE. — Ernest L. Ransome, San Francisco, Cal.

322,016. VARNISH.—Henry T. Smith, Cooke County, Tex.

322,037. DEVICE FOR HANGING DOORS.—Francis B. Boalt, Binghamton, N. Y.

322,047. TRIMMER-ARCH. — William S. Eames, St. Louis, Mo.

322,049. METHOD OF MANUFACTURING GIRDERS.—Albert H. Emery, Stamford, Conn.

322,050. MANUFACTURE OF METALLIC COLUMNS.—Albert H. Emery, Stamford, Conn.

322,078. CISTERN AND FLUSHING APPARATUS FOR WATER-CLOSETS. — William Strong, Indianapolis, Ind.

322,086. THRESHOLD. — Daniel Bartholomew, Red Cloud, Neb.

322,101. WATER-CLOSET. — James L. Howard and Charles P. Howard, Hartford, Conn.

322,107. HOT-AIR FURNACE. — Miron H. Jacobs, Syracuse, N. Y.

322,114. SELF-CLOSING FAUCET.—Henry B. Leach, Boston, Mass.

322,153. FELT ROOFING.—Lewis F. Blair and John W. Roche, Oswego, N. Y.

322,168. LAMP FOR ILLUMINATING, HEATING AND VENTILATING ROOMS. — Benjamin F. Enoch, Bergen Point, N. J.

322,178. PNEUMATIC DISPATCH AND SPEAKING-TUBE SYSTEM.—Richard J. P. Goodwin, Manchester, N. H.

322,182. SASH-HOLDER.—William D. Isett, Altoona, Pa.

322,206. FIRE-ESCAPE.—Isaac S. Smeltzer, Columbus, O.

322,211. DOOR-BOLT.—John F. Taylor, West Park, N. Y.

322,218. HYDRAULIC DOOR-CHECK. — Leo Wadack and Alois Graffy, Berlin, Germany.

322,222. CLAMP FOR EAVES-TROUGH. — George D. Waters, Cedarvale, Kans.

322,235. APPARATUS FOR THE MANUFACTURE OF WHITE LEAD.—William V. Wilson, London, Eng.

322,239. HINGE. — Frank W. Beckwith, Detroit, Mich.

322,256. WRENCH. — Thos. J. Campbell, Westfield, Mass.

322,280. FIRE-PROOFING COMPOUND. — John T. Greenwood, Jr., Beloit, Wis.

322,304. SPOKESHAVE AND CHAMFER-CUTTER. — James Mander, Philadelphia, Pa.

322,307. PLASTIC COMPOUND FOR WALLS, ETC. — Henry W. Merritt, Boston, Mass.

322,328. WINDOW-GRATING. — John W. Showalter and George W. Mauger, Pottstown, Pa.

322,369. FLOOR-CLAMP.—Jacob M. Groce, Ravenswood, W. Va.

322,377. VENTILATING-CAP.—John A. Hughes and Charles S. Mengel, Philadelphia, Pa.

322,388. WATER-CLOSET SUPPLY-VALVE. — Henry S. Lord, Hartford, Conn.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report nineteen permits have been granted, the more important of which are the following:

Geo. E. Bay, 20 three-st'y brick buildings, e s Argyle Ave., bet. Biddle and Greenwillow Sts.

N. Wolfman, 2 three-st'y brick buildings, com. s e cor. Jefferson and Chapel Sts.

M. Kaufman, three-st'y brick building, e s Broadway, n of Madison St.

Corpus Christi Church, stone church, s w cor. Mt Royal Ave. and Townsend St.

M. Holler, 2 two-st'y brick buildings, s w cor. Monument and Luzerne Sts.

H. W. Keck, 3 two-st'y brick buildings (square), e s Bluney St., bet. Dillon and Hudson Sts.

F. O. Singer, 8 two-st'y brick buildings, n s Mosher St., com. n w cor. Carey St.; and 3 two-st'y brick buildings, w s Carey St., n of Mosher St.

Jacob Saum, 9 two-st'y brick buildings, w s Gilmor St., s w cor. Cole St.; and 5 two-st'y brick buildings, s s Cole St., w of Gilmor St.

M. J. Dorsey, 2 two-st'y brick buildings, e s Dexter St., bet. Stockholm and Cross Sts.

Brooklyn.

BUILDING PERMITS. — *Warren St.*, river front, six-st'y brick warehouse, gravel roof; cost, $35,000; owner, Jeremiah P. Robinson.

Jefferson St., s s, 55' w Throop Ave., two-st'y and mansard dwell., tin roof, wooden cornice; cost, $7,000; owner, — McBride, Ninth St., near South Second St.; architect, E. F. Gaylor; builders, S. J. Burrows and Marinus & Gill.

First St., s w cor. North Eighth St., three-st'y brick factory, tin roof; cost, $11,000; owner, Eugene Doherty, North Ninth St., cor. Second St.; architect, T. F. Houghton; builders, J. Rooney and J. Fallon.

Greene St., *Nos.* 243 *and* 245, 3 three-st'y frame tenements, gravel roofs; cost, each, $3,000; owner, Henry C. Fisher, 119 Norman Ave.; architect and contractor, C. Dunkhase; mason, Wm. Fischer.

South Fifth St., s w cor. Third St., 2 brick buildings for stable and shop, tin roof; cost, $2,000 and $3,500; owner and builder, Bernard Gallagher, 122 Union Ave.; architect, E. F. Gaylor.

Union Ave., s e cor. Meserole St., four-st'y brick store and tenement, tin roof; cost, $10,500; owner, L. Marquardt, on premises; architect, Th. Engelhardt; builders, J. Auer and J. Bossert.

Broadway, e s, 25' s Ellery St., 2 three-st'y frame store and dwells., tin roofs; cost, each, $6,000; owner, Mrs. Skillman; builders, J. Rueger and R. Guenscher.

Ormond Pl., e s, 100' s Jefferson St., three-st'y brick dwell., tin roof; cost, $9,000; owner, W. B. Smith, 107 Schermerhorn St.; architect, C. Werner; builders, O. Nolan and J. Rome.

Bushwick Ave., s w cor. Schaeffer St., two-st'y frame (brick-filled) dwell., tin roof; cost, $4,500; owner, John W. Crawford, 145 Woodbine St., builder, J. E. Sager.

South Ninth St., *No.* 238, three-st'y brown-stone dwell., tin roof, iron cornice; cost, $11,0 0; owner, Robert Thomas, 244 South Ninth St.; builder, T. Gibbons.

Eighth Ave., w s, 40' s Berkeley Pl., 3 three-st'y and attic brown-stone dwells., tin roofs; cost, each, $12,000; owner and builder, William Gubbins, 20 Seventh Ave.; architect, C. Werner.

Marion St., s s, 2 0' w Ralph Ave., three-st'y frame (brick-filled) dwell., tin roof; cost, $3,700; owner, Frederick Goebel; architect, A. Hill; builders, Weekes & Lauer.

North Ninth St., n w cor. Sixth St., three-st'y brick factory, gravel roof; cost, $3,200; owners, Longman & Martinez, 207 Pearl St., New York; architects, J. H. Doremus and Chas. Good.

Maujer St., s s, 87' e Bushwick Ave., three-st'y Belleville stone dwell., slate roof; cost, $40,000; owners, Nuns of St. Dominic, Montrose and Graham Aves.; architect, W. Schickel; builders, W. & T. Lamb, Jr

Prospect Ave., s s, 175' e Seventh Ave., 2 three-st'y frame tenements, tin roofs; cost, $4,400; owner and mason, H. B. Lyons; contractor, not selected; architect, W. M Coots.

Butler St., s s, 122' w Rogers Ave., two-st'y brick dwell., tin roof; cost, $3,500; owner, C. O. Sabine, 305 Hicks St.; architects, King & Roeher; builders, W. &. E. H. Hawkins and T. Walley.

Garfield Pl., n s, 95' 9" w Fifth Ave., 5 two-st'y brick dwells., gravel roofs; cost, each, $3,000; Geo. R. Brown, 31 South Portland Ave.; builder, L. E. Brown.

Devoe St., n s, 212' 10" e Bushwick Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,800; owner, Leopold Fritz, on premises; architect, G. Hillenbrand; builders, A. Annan and C. Buchheit.

Stockton St., *No.* 187, three st'y frame tenement, tin roof; cost, $4,000; owner and builder, Andrew Wills, 137 Stockton St.; architect, H. Vollweiler.

Brooklyn Ave., w s, 25' n Herkimer St., three-st'y brick stable, tin or gravel roof; cost, $12,000; owners, architects and builders, Ashfield & Son, 631 St. Marks Ave.

ALTERATIONS. — *Vanderbilt Ave.*, n w cor. Park Pl., one-st'y brick extension, tin roof, bay-window; cost, $3,000; owner, John Hanscom, Vanderbilt Ave., cor. Park Pl.; architect, M. J. Morrill; builders, P. Carlin & Sons and J. S. McRea.

Court St., *No.* 58, four-st'y brick extension, tin roof; cost, $4,000; owner, Joseph Hohn, 138 Livingston St.; architect, C. F. Eisenach; builders, J. J. Bentzen and C. Dietrich.

Fulton St., *No.* 425, new cellar, also walls, etc.; cost, $4,000; owner, S. B. Duryea, 46 Remsen St.; architect, M. J. Morrill; builders, J. Stevenson & Son and A. Williamson.

Bushwick Ave., Maujer and Ten Eyck Sts., one-st'y brick extension, slate roof; cost, $5,000; owners, Nuns of St. Dominic, on premises; architect, Wm. Schickel, builders, W. & T. Lamb, Jr.

Furman St., *Nos.* 147 *and* 149, add one st'y, rebuild front and repair party-walls; cost, $10,000; owner, Gordon L. Ford, 97 Clark St., and Lorin Palmer, 142 Columbia Heights; architect, C. F. Eisenach; builders, T. Donlon and W. S. Wright.

Hicks St., n w cor. Joralemon St., add 3' peak slate roof, new pediments, new terra-cotta sills, lintels, etc., stoop shifted to Hicks St. front; cost, $6,000; owner, Mrs. Packer, Grace Ct.; architect, Parfitt Bros.; builder, J. A. De Camp.

Prospect Pl., *Nos.* 119 *and* 121, add one st'y to each house; cost, $4,000; owner, James Chambers, architect and builder, T. K. Schermerhorn,

Chicago.

BUILDING PERMITS. — M. Gutrich, three-st'y store and dwell., 3252 Wentworth Ave.; cost, $5,000; architect, J. Frank.

Mrs. A. R. Blair, two-st'y dwell., 166 Rush St.; cost, $12,000; architects, Cobb & Frost.

P. A. O'Neill, remodel building, 92 Van Buren St.; cost, $17,000; architect, Halb rg.

S. Meaney, three-st'y flats, 99 Sigel St.; cost, $3,000.

F. J. Loesch, two-st'y dwell., 46 Lincoln Pl.; cost, $4,500.

F. W. Maurer, three-st'y store and flats, 755 West Twelfth St.; cost, $7,000.

J. Gunderman, three-st'y store and dwell., 182 North Ave.; cost, $7,000.

C. T. Bullock, three-st'y store and dwell., Van Buren St.; cost, $8,000.

J. Engburg, two-st'y dwell., 563 Hulbert St.; cost, $4,500; architect, J. Otter.

C. Linke, two-st'y dwell., 86 Jay St.; cost, $2,500.

G. Harding, basement, 11 Clarkson St.; cost, $3,000.

J. Buehler & Co., 5 two-st'y stores and flats, 1103–1115 Milwaukee Ave.; cost, $18,000; architect, H. Kley.

J. Buehler & Co., one-st'y rink, rear 1103–1115 Milwaukee Ave.; cost, $10,000.

J. Parker, Jr., three-st'y flats, 522 Monroe St.; cost, $9,000; architect, J. Huber.

C. Junge, three-st'y store and flats, 926–928 Milwaukee Ave.; cost, $15,000; architect, H. Sierks.

M. C. Dillon, two-st'y dwell., 750 Warren Ave.; cost, $2,500.

Mrs. C. O'Brien, two-st'y dwell., 39 Pierson St.; cost, $4,500.

A. Blather, two-st'y dwell., 92 Nineteenth St.; cost, $4,000.

F. Norman, two-st'y dwell., 140 Clybourne Ave.; cost, $4,000.

O. G. Ostrom, 8 two-st'y dwells., 295–311 Schiller St.; cost, $50,000.

Stolzenfeld & Schacker, 2 two-st'y flats, 356–358 Henry St.; cost, $5,000.

F. A. Nixon, two-st'y dwell., 97 Thirty-seventh St.; cost, $6,500.

C. R. Lott, two-st'y dwell., 465 Congress St.; cost, $3,600.

C. B. Carter, two-st'y dwell., 3321 Vernon Ave.; cost, $8,000.

Mrs. C. Lunden, four-st'y store and flats, 123 Chicago Ave.; cost, $8,000.

M. Brand & Co., one additional story, 256–262 Blue Island Ave.; cost, $15,000; architect, C. H. Gettig.

J. Gardner, two-st'y dwell., 725–727 Superior St.; cost, $5,500.

E. Webber, two-st'y dwell., 164 Ambrose St.; cost, $2,600.

J. Clark, six-st'y office-building, Sherman St.; cost, $150,000.

J. C. Armbruster, two-st'y store and dwell., 625 Twelfth St.; cost, $4,000.

Mrs. M. Richardson, two-st'y dwell., 3013 Lock St.; cost, $3,000.

C. Muehlke, 2 two-st'y dwells., 297–299 State St.; cost, $14,000.

H. Ganske, two-st'y store and dwell., 829 Twenty-first St.; cost, $4,600.

C. Kind, two-st'y store and dwell., 1100 Leavitt St.; cost, $4,000.

Cincinnati.

BUILDING PERMITS. — H. Brochman, four-st'y building, Elm and Liberty Sts.; cost, $3,000.

Jno. Sperry & Co., three-st'y building, Main and Ninth Sts.; cost, $7,600.

A. Hample, two-and-one-half-st'y building, Richmond and Freeman Sts.; cost, $3,000.

Hoeple & Co., two-st'y building, McMillan and Madison Sts.; cost, $8,300.

Thos. Owens, two-st'y building, Gilman St.; cost, $8,500.

C. Doer, four-st'y building, Vine and Canal Sts.; cost, $9,000.

David Sinton, remodel Grand Opera-House; cost, $5,000.

H. Cook, two-st'y building, Harrison Pike; cost, $4,000.

J. B. Foraker, Cross Lane and Elm St.; cost, $7,000.

A. Torrence, two-st'y building, Bignall and Carmel Sts.; cost, $2,500.

Wm. H. Stewart Sons, five-st'y building, Sixth and Sycamore Sts.; cost, $6,500.

Wm. H. Stewart Sons, two-st'y building, Biglow St.; cost, $6,200.

A. Aukenbauer, two-st'y building, Blue Rock and Cherry Sts.; cost, $2,000.

Fred. Otte, four-st'y building, Race and Fifteenth Sts.; cost, $7,000.

Marcus & Wessel, two-st'y building, Colrain Pike and State St.; cost, $2,500.

G. & A. Stiebel, 3 two-st'y buildings, Spring Grove Ave. and Queen City; cost, $6,600.

J. J. Holekamp, three-and-one-half-st'y building, Baymiller and Clinton Sts.; cost, $3,000.

Audlebrinker & Treking, three-st'y building, Elm and Findlay Sts.; cost, $5,000.

Wm. H. Stewart Sons, three-st'y building, Biglow Ave.; cost, $6,000.

H. Rummelbaum, three-st'y building, Main and Liberty Sts.; cost, $2,100.

C. Grobrecht, three-st'y building, Camp Washington; cost, $5,000.

Mrs. M. L. Dibble, two-st'y building, Pardrome St.; cost, $2,000.

L. Marchs, five-st'y building, Third and Main Sts.; cost, $4,000.

J. H. Gressman, two-and-one-half-st'y building, Brown and Marshall Sts.; cost, $2,000.

J. M. Glenn, remodel, Broadway and Third St.; cost, $2,000.

L. P. Hazen, two-and-one-half-st'y building, Pardrome and Paralax; cost, $3,000.

Gambrinus Stock Co., addition Abigail and Broadway; cost, $8,000.

Wm. Boch, two-st'y building, Wayne and Kelly Sts.; cost, $2,700.

Henry Rothshop, four-st'y building, Fifteenth and Main Sts.; cost, $6,000.

Wm. Soelter, three-and-one-half-st'y building, Dayton and Coleman Sts.; cost, $7,000.

Miss M. Zaone, two-and-one-half-st'y building, Liberty and Spencer Sts.; cost, $6,000.

Aufenbrink & Friedking, four-st'y building, Elm and Fifth St.; cost, $2,000.

G. T. Nieber, remodelling, Race and Eighth Sts.; cost, $17,000.

S. Asmess, three-and-one-half-st'y building, Adams St.; cost, $3,000.

Martin Johnston, three-st'y building, Peters St.; cost, $3,000.

Louis Meyer, two-st'y building, Mulberry and Race Sts.; cost, $2,800.

V. Whetman, 7 two-st'y buildings, Flint and Denman Sts.; cost, $7,000.

Jos. Rawson, six-st'y building, Sixth and Race Sts.; cost, $35,000.

H. Grosweln & Sons, two-st'y building, State Ave. and Findlay St.; cost, $4,800.

34 permits; cost, $24,483.

Total cost to date, $1,317,203.

Permits to date, 633.

New York.

Building Permits. — *Hester St., No.* 25, five-st'y brick tenement, tin roof; cost, $18,000; owner, Rachel Kurzman, on premises; architect, Chas. Rentz.

West Seventeenth St., No. 317, five-st'y brick tenement, tin roof; cost, $15,000; owner, Chas. J. Day, 23 West Twelfth St.; architects, Babcock & McAvoy.

Reade St., No. 111, five-st'y brick warehouse, tin roof; cost, $17,000; owner, Marie L. Combes, Newtown, N. Y.; architects, Berger & Baylies.

Elizabeth St., Nos. 271 *and* 273, two-st'y brick dwell. with stores, tin roof; cost, $5,000; trustee, Geo. W. Weeks, 128 Hooper St., Brooklyn; architects, Berger & Baylies; builders, G. Staiger and C. Staiger.

West Thirtieth St., Nos. 447 *and* 449, three-st'y brick factory or storage building, tin roof; cost, $12,000; owner, Wm. Wilson, Mt. Vernon, N. Y.; builder, J. J. Kierst.

East Forty-second St., Nos. 228 *and* 230, 2 five-st'y brick tenements, tin roofs; cost, total, $40,000; Joseph and Robert Gordon, Second Ave., s w cor. Thirty-ninth St.; architect, Albert Wagner.

East Fifteenth St., No. 510, four-st'y brick school, tin roof; cost, $14,000; owner, Rev. John Edwards, 503 East Fourteenth St.; architect, L. J. O'Connor.

West Thirty-seventh St., No. 456, five-st'y brick tenement with stores, tin roof; cost, $15,000; owner, James Madden, 500 Eighth Ave.; architect, W. Holman Smith.

West Thirty-eighth St., No. 331, five-st'y brick tenement with stores, tin roof; cost, $17,000; owner, Philip Hofmann, 305 West Thirty-eighth St.; architect, M. L. Ungrich.

East Twelfth St., No. 533, five-st'y brick tenement with stores, tin roof; cost, $12,000; owner, Fritz Heerlein, 932 Second Ave.; architect, Wm. Graul.

First Ave., No. 960, four-st'y brick tenement, tin roof; cost, $7,000; owner, George Whitefield, 140 East Fifty-fifth St.; architects, A. B. Ogden & Son.

East Sixtieth St., Nos. 312 *and* 314, 2 five-st'y brick tenements, tin roofs; cost, each, $17,000; owners, Lichtenstein Bros. & Co., Thirty-eighth St., cor. Second Ave.; architects, Schwarzmann & Buchman.

One Hundred and Fourth St., s s, 113' e First Ave., two-st'y brick sash and blind factory, with 26-foot extension, tin roof; cost, $15,000; owner, Wilhelmine Juch, 401 East One Hundred and Sixth St.; builder, Wm. A. Juch.

One Hundred and Sixth St., s s, 20' e Lexington Ave., 3 four-st'y brick tenements, tin roofs; cost, each, $15,000; owner, Thomas F. Cooke, 351 East Eighty-seventh St.; architect, G. A. Schellenger.

One Hundred and Twenty-fourth St., s w cor. Fourth Ave., 4 five st'y brick tenements, tin roofs; cost, total, $100,000; owner, Henry Muhlker, 129 East One Hundred and Fourteenth St.; architect, R. W. Treffenberg.

Third Ave., s w cor. Eighty-fourth St., 4 five-st'y brick (stone front) tenements with stores, tin roofs; cost, each, $20,000; owner, Thomas Smith, 1628 Lexington Ave.; architects, Babcock & McAvoy.

Eighty-fourth St., s s, 93' 6" w Third Ave., 6 five-st'y (stone front) tenements, tin roofs; cost, each, $20,000; owner and architect, same as last.

One Hundred and Eighteenth St., s s, foot of and Harlem River, one-st'y brick factory, and one-st'y brick enclosure for gas producers, tin roof; cost, $10,000; owners, R. H. Wolff & Co. (Limited), One Hundred and Eighteenth St. and Harlem River; architects, Schwarzmann & Buchman.

Sixty-first St., n s., 100' w First Ave., 3 five-st'y brick tenements, tin roofs: cost, each, $14,000; owner, John O'Sullivan, 74 East One Hundred and Twelfth Sts.; architect, A. B. Ogden & Son.

East One Hundred and Third St., No. 202, two-st'y brick stable, tin roof; cost, $4,000; owner, Francis McEntee, 216 East One Hundred and Fifth St.; architect, A. Spence.

Eighty-fourth St., n s, 100' w Eighth Ave., 4 four-st'y and basement brick (stone front) dwells., tin roofs; cost, each, $18,000; owner, Terence Kiernan, 317 East Eighty-third St.; architect, F. F. Ward; builder, not selected.

Sixth Ave., s w cor. One Hundred and Sixteenth St., 12 four-st'y brick dwells., tin roofs; cost, each, $15,000; owner, Jacob C. Butler, 235 West One Hundred and Twenty-ninth Sts.; architects, Hubert, Pirsson & Co.

One Hundred and Twenty-second St., n s, 375' w Sixth Ave., 6 three-st'y and attic brick dwells., flat roof, tinned; mansard of brick and terra-cotta; owner, C. W. Goold, 74 East One Hundred and Twenty-seventh St.; architect, F. H. Kimball; builders, J. & W. C. Spears and A. N. Gatchell.

One Hundred and Thirty-fourth St., n s, 100' w Seventh Ave., 6 three st'y brick dwells., tin and slate roofs; cost, each, $7,000; owner, Margaret Gessner, 1722 Madison Ave.; architect, R. R. Davis.

One Hundred and Forty-sixth St., s s, 200' e Tenth Ave., 2 four-st'y brick flats, gravel roofs; cost, each, $10,000; owner and builder, John Donnellon, One Hundred and Forty-sixth St., near St. Nicholas Ave.; architect, B. W. Warner.

Tenth Ave., w s, One Hundred and Fiftieth to One Hundred and Fifty-first St., three-st'y brick silk mill, cemented fire proof peaked roof; owners, Joseph Loth & Co., 333 West Twenty-second St.; architect, Hugo Kafka; masons, List & Lennon.

One Hundred and Sixty-third St., abt. 100' w Ridge Road, one-and-one-half-st'y frame stable and coach-house, tin roof; cost, $3,000; owners, Institution for the Deaf and Dumb, Station M., New York City; architect, Henry Interman; builders, C. R. Terwilliger and James Pettit.

North Third Ave., No. 114, one-st'y brick car-house, felt and gravel roof; cost, $3,500; owners, H. B. M. & F. R. W. Co., Henry Spratley, President, 1033 Boston Ave.; architect, W. W. Gardiner.

Railroad Ave., e s, 75' n One Hundred and Sixty-ninth St., three-st'y frame tenement, tin roof; cost, $5,000; owner, Frank Litter, Franklin Ave., cor. One Hundred and Sixty-ninth St.; architect and builder, Henry Piering.

Sedgwick Ave., e s, abt. ½ mile n e Morris Dock Station of N. Y. C. & H. R. R. R., three-st'y brick dwell., slate and tin roofs; cost abt. $22,600; owner, Herman C. Schwab, Highbridge P. O., New York City; architect, Carl Pfeiffer; builders, Frank Lyons and Grissler & Fausel.

Alterations. — *Fifty-first St.*, s s, abt. 400' w Sixth Ave., four-st'y brick extension, felt and gravel roof; cost, $40,000; owners, Broadway and Seventh Avenue R. R. Co., Fiftieth and Fifty-first Sts., bet. Sixth and Seventh Aves.; architect, S. D. Hatch.

West Fourth St., No. 299, three-st'y brick extension, tin roof; cost, $5,000; owner, H. B. Meersse, on premises; architect, J. W. Cole; builder, J. Jordan.

Fifth St., No. 533, one-and-two-st'y brick extension, tin roof and internal alterations and repairs; cost, $4,000; lessees, Nat'l Bohemian Soc., Francis Linke, committee, on premises; architects, Berger & Baylies.

East Twentieth St., No. 27, two-st'y brick extension, tin roof, bay window on front, piers removed front and rear, and walls supported on iron girders; cost, $10,000; owner, James Muir, 104 East Sixty-first St.; builders, J. J. Tucker and A. C. Hoe & Co.

West Fourth St., No. 235, four-st'y brick extension, tin roof; cost, $8,500; owner, Jane McKeown, 245 West Fourth St.; architect, E. Gruwe.

West Fifty-fourth St., No. 123, five-st'y brick extension, tin roof; cost, $13,000; owner, Timothy Geohegan, on premises; architect, E. Gruwe.

One Hundred and Seventh St., n s, from Fourth to Lexington Aves., internal alterations, new galleries, etc.; cost, abt. $20,000; owners, New Coliseum Co., One Hundred and Seventh St. and Lexington Ave.; architect, R. N. Anderson.

Lexington Ave., n w cor. One Hundred and Seventieth St., 4 buildings raised two stories; cost, abt. $10,000; owner and architect, same as last.

Philadelphia.

Building Permits.—*Franklin St.*, n of Jefferson St., three-st'y dwell., 16' 6" x 70'; G. R. Stewart, contractor.

Brunner St., e of Wayne St., 10 three-st'y dwells., 15' x 38'; W. D. Dounton, contractor.

Franklin St., n of Harrison St., 6 two-st'y dwells., 15' x 48'; Taylor & Roberts, contractors.

Maud St., n of Twenty-seventh St., 7 two-st'y dwells., 15' x 39'; J. E. Ridgway, owner.

Warnock St., n of Indiana Ave., 4 two-st'y dwells., 16' x 42'; B. H. Senderlin, contractor.

Sepviva St., cor. Gordon St., 2 two-st'y dwells., 15' x 20'; J. McNutt, contractor.

Edgmont St., s of Division St., 6 two-st'y dwells., 13' x 34'; L. J. Wolff, owner.

Twenty-first St., n w cor. Market St., market, 99' x 137'; R. W. Strode, contractor.

Market St., No. 707, one-st'y addition, 20' x 30'; R. W. Strode, contractor.

Beach St., No. 957, two-st'y warehouse, 20' x 45'; Thos. Campbell, owner.

Sansom St., w of Thirty-seventh St., 2 three-st'y dwells., 15' x 45'; L. W. Goodman, contractor.

Preston St., n of Fairmount Ave., 4 two-st'y dwells., 13' x 42'; J. F. Winner, owner.

Thirteenth St., s of Market St., four-st'y addition, 60' x 253'; Jno. Wanamaker, owner.

Watt St., s of Federal St., two-st'y stable, 16' x 44'; W. Kennedy, contractor.

Oates St., n of Wood St., 2 two-st'y dwells., 20' x 49'; S. Lyster, contractor.

Tenth St., s w cor. Moore St., two-st'y dwell., 16' x 40'; T. C. Nesbitt, contractor.

South Eleventh St., No. 1303, two-st'y dwell., 15' x 43'; C. D. Supple, contractor.

Hanover St., n of Thompson St., three-st'y dwell., 16' 6" x 59'; C. G. Harris, contractor.

Rose St., n of Commerce St., 4 two-st'y dwells., 14' x 30'; T. L. Kelly, owner.

Greenway Ave., w of Sixty-sixth St., 2 two-st'y dwells., 18' 6" x 46'; C. H. Tribitt & Co., contractors.

Callowhill St., w of Second St., three-st'y store-house, 20' x 57'; S. S. Myers, owner.

Merion St., w of Forty-fifth St., 4 two-st'y dwells., 15' 4" x 40'; T. Burroughs, owner.

Union St., w of Front St., 2 three-st'y stores, 18' x 90' and 24' x 140'; Philip Fitzpatrick, owner.

Somersett St., n of Garnett St., 2 two-st'y dwells., 14' x 30'; Jno. Patton, owner.

School Lane, n e cor. Wayne St., three-st'y dwell., 40' x 74'; Geo. Hirst, contractor.

Laurel St., No. 132, smoke-house, 16' x 36'; Wm. Moland & Sons, owners.

Nicetown Lane, w of Twenty-first St., three-st'y dwell., 16' 4" x 44'; McLaughlin & McNamara, contractors.

Clearfield St., w of Amber St., 2 two-st'y dwells., 15' x 42'; J. P. Pyle, owner.

Sixth St., n of Poplar St., three-st'y brick and stone dwell., 20' x 60'; Hazlehurst & Huckel, architects.

Elm Ave., cor. Forty-ninth St., three-st'y dwell. and stable and carriage-house to correspond; to be built of brick and stone; Hazlehurst & Huckel, architects.

St. Paul, Minn.

Building Permits.—Two-st'y block of frame dwells., w s of Orleut St., between Mt. Airy and Thirteenth St.; cost, $2,400; owner, G. B. Elwell.

Two-st'y frame addition to dwell., n s of Summit Ave., between Alice and St. Peter Sts.; cost, $3,0 0; owner, T. D. Simonton.

Two-st'y frame dwell., n s of Selby Ave., between Mackubin and Kent St.; cost, $2,500; owner, F. W. Forbes.

Two-st'y brick chemical engine-house, n s of George St., between Robie and Stryker Ave.; cost, $4,000; owner. City of St. Paul.

Two-st'y brick fire engine-house, s s of Randolph St., between Bay and View Sts.; cost, $4,000; owner, City of St. Paul.

Two-st'y brick fire engine-house, s s of Ross St., between Cypress and Earl Sts.; cost, $4,000; owner, City of St. Paul.

Two-st'y brick fire engine-house, n s of Edmund St., between Marion and Rice Sts.; cost, $4,000; owner, City of St. Paul.

Three-st'y brick double dwell., n s of Ramsey St., between Forbes and Pleasant Sts.; cost, $14,000; owners, R. C. Wiley and F. J. Romer.

Four-st'y brick block, stores and offices, n s of Seventh St., between Minnesota and Cedar Sts.; cost, $40,000; owner, McQuillan Estate.

Two-st'y frame dwell., e s of Chatsworth St., between Division and Leslie Sts.; cost, $1,500; owner, J. H. Morong.

Two-st'y brick store and dwell., e s of Greenwood St., between Winnifred and Susan Sts ; cost, $2,400; owner, Anton Sheidle.

Two-st'y frame dwell., s s of Ashland Ave., between Mackubin and Kent Sts.; cost, $3,600; owner, A. D. S. Johnston.

St. Louis.

Building Permits.—One hundred and forty-two permits have been issued since our last report, thirty-five of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—

Northern Presbyterian Church, two-st'y brick parsonage; cost, $3,500; architect, J. Beattie; contractor, S. H. Shaffner.

Cornelius Lynch, two-st'y brick dwell.; cost, $4,000; architect, J. Johnston.

A. Cooper, 7 adjacent two-st'y brick dwells.; cost, $17,500; contractor, A. Cooper.

A. Cooper, 3 adjacent two-st'y brick dwells.; cost, $7,500; contractor, same as last.

Francis T. Bryan, three-st'y store; cost, $11,500; contractor, F. W. Loffhagen.

E. F. Wickham, two-st'y dwell.; cost, $10,000; architects, George I. Barnett & Son; contractor, M. Kirkwood.

Mrs. B. C. Hayden, two-st'y dwell.; cost, $2,800; contractor, Wm. Damon.

John E. McFleeney, two-st'y tenement; cost, $3,800; architect, G. W. Pipe; contract sub-let.

Leverett Bell, two-st'y dwell.; cost, $8,000; architects, Eames & Young; contractor, Frank Greene.

H. Lampe, two-st'y dwell.; cost, $4,000; contractor, T. B. Hartmann.

Miss S. Tacey, 2 two-st'y dwells.; cost, each $4,000; contractor, J. W. Barnes.

Wm. Sharpenhurg, two-st'y dwell.; cost, $2,500; contractor, B. Koetters.

Mrs. M. Readon, 3 adjacent two-st'y brick dwells., cost, $4,500; contractor, J. W. Kerney.

Penny & Gentles, three-st'y brick business building; cost, $15,000; architect, J. Beattie; contractor, S. Hoffmann.

John Andre, two-st'y double brick stere and rooms above; cost, $6,000; architect, A. Beinke; contractor, Wm. Rlewe & Son.

Mrs. C. Heine, two-st'y double brick dwell.; cost, $4,500; architect, Pipe; contractor, S. H. Shaffner.

E. Engelhardt, three-st'y brick store and rooms above; cost, $3,250; contractor, B. Eppman.

C. Kern, two-st'y double brick dwell.; cost, $4,000; contractor, H. Sudhoelter.

E. Link, two-st'y double brick dwell.; cost, $9,000; architect, Wm. Whri; contractor, A. Whri.

A. Bevis, 4 adjacent two-st'y dwells.; cost, $12,000; architect, C. K. Ramsey; contract sub-let.

J. W. Dill, two-st'y brick dwell.; cost, $7,000; architect, C. K. Ramsey; contract sub-let.

E. Tonzirk, two-st'y brick dwell.; cost, $2,600; contractor, A. Vosse.

Mrs. Steele, two-st'y brick store and dwell.; cost, $3,500; contractor, P. Brennan.

P. O'Donnell, 2 adjacent two-st'y brick tenements; cost, $3,000; contractor, John O'Malley.

Anheuser Busch Brew. Co., four-st'y brick storage house; cost, $30,000; architects, E. Jungenfeld & Co.; contract sub-let.

Wm. Crouch, two-st'y brick dwell.; cost, $3,300; architect, C. C. Helmers; contractor, Charles Gerhardt.

General Notes.

Canterbury, N. H.— The trustees of the Kezar Seminary broke ground June 15 for the laying of the foundation of the main building.

Carroll County, Md.—St. Barnabas Church; T. B. Ghequier, architect, Baltimore.

Cleveland, O.—Woodland Ave., carriage repository and factory, 39' x 40' and 74' above sidewalk, with basement under whole; cost, $12,000; Harm & Schuster, owners; Theo. Rosenberg, architect.

Harford County, Md. — St. Mary's Church; T. B. Ghequier, architect, Baltimore.

Lincoln, Neb. — Frame dwell. for S. H. Burnham; cost, $5,000; John Calvin Stevens, architect, Portland, Me.

PROPOSALS.

CEMETERY-WALL.

[Near East New York, L. I.]

Office National Cemeteries,
Washington, D. C., July 2, 1885.

Sealed proposals, in triplicate, with a copy of this advertisement attached to each, will be received at this office **until Wednesday, August 5, 1885**, for construction of stone enclosing wall at the Cypress Hill National Cemetery, near East New York, Long Island, N. Y.

Specifications for the work and blank forms of proposals can be procured, and plans examined on application to quartermaster's office, Greene and Houston Sts., New York, at the cemetery, and at this office.

Proposals should be endorsed "Proposals for Enclosing Wall at Cypress Hills," and addressed to the undersigned. They will be opened at this office at noon on the date above named, when bidders are invited to be present.

The right is reserved to reject any or all bids.

R. N. BATCHELDER,
501 Deputy Q. M. General, U. S. Army

(*Continued on page* xii.)

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 502.

AUGUST 8, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE *Fireman's Journal* gives some statistics in regard to the causes of fires during the year 1884, compiled from the annual volume published by the New York *Chronicle*, and illustrated by a diagram showing the aggregate number of fires due to each of the twenty-seven principal causes arranged as segments of a circle. The largest segment, of course, is occupied by Incendiarism, which is charged with nearly thirty per cent of all the fires. The next, taking in an area rather more than one-third as great as that of incendiarism, is the segment devoted to Defective Flues, the euphemism, as we consider it, for the natural result of criminal dishonesty or stupidity on the part of bricklayers. The third place in the list seems to be disputed between Matches and Explosions of Lamps and Lanterns, but these are closely followed by Lightning and Sparks. Indeed, sparks from locomotives and other sources together set more fires than anything else except defective flues and incendiarism. Hot stoves and stove-pipes cause about as many fires as spontaneous combustion, and next to these the carelessness of tramps is the most efficient factor in destroying combustible property. Fireworks and fire-crackers cause many conflagrations, although not so many as either tramps or unprotected gas-jets, and not many more than neglected cigar-stumps. In regard to the character and value of the buildings destroyed, we find that dwelling-houses head the list, about one of these being burned every hour in the United States, with an average loss of thirteen hundred and ninety-six dollars. Next in number come the fires in barns and stables, of which fifty are consumed every week, but the amount of property destroyed in them is far exceeded by that burned up in country stores, which disappear at the rate of three a day, carrying off with them one hundred and ten thousand dollars a week. More than ten hotels a week vanish into smoke, and with them nearly forty-four hundred thousand dollars a year; and one flour mill, with twelve thousand dollars worth of some one's property, burns up every working day. Lumber yards stand next in rank, for, although fires in these occur only about once in two days, the average loss in each is more than twenty thousand dollars. It is singular that the number of fires, and the average loss in each case, is almost exactly the same for cotton-factories, woolen-mills and chemical-works, the number of fires in the first during the year having been forty-four, in the second forty-three, and in the third forty-two, while the average losses were approximately twenty-eight, twenty-five and twenty-seven thousand dollars in the three classes. In number, boot and shoe factories approach the others, forty-two having been destroyed, but the average loss in these is only seventeen thousand five hundred dollars. Five theatres a month have been burned, with an average loss of about nineteen thousand dollars, and about half as many court-houses, with nearly the same average loss. Looking at the statistics with regard to the locality of fires, it appears, as the *Fireman's Journal* says, that the losses from this cause last year amounted in the State of Georgia to more than the whole cost of carrying on the State Government, including the interest on the public debt.

ONE of those curious ordinances which the envious imagine to have been devised for the purpose of levying tribute from those whose interest lies in disobeying them, forbids the hoisting of safes into the windows of buildings in the city of New York. As safes, however, must be used in buildings, and as the best, if not the only practicable way in many cases of getting them into buildings is to hoist them from the sidewalk into the windows, the ordinance has never been generally enforced until the other day, when notice was served on the Marvin Safe Company, one of the principal manufucturers in the city, to refrain from delivering goods in this way. The Marvin Company, instead of compromising the matter, prepared for open resistance, and applied for an injunction to restrain the city authorities from enforcing the rule, on the ground that the prohibition of the ordinary mode of delivering safes would ruin its business. A preliminary injunction was granted, but a subsequent motion to make the injunction permanent is still under consideration, with, we should say, the chances against the Safe Company, which would have shown itself more prudent, as well as more public-spirited, if it had opposed the original passage of the ordinance, or had secured its speedy revocation, in the interest of all the manufacturers as well as its own.

WE learn that the competition for the Court-House at Richmond, Va., has been decided by the award of the first prize to Messrs. Wait & Cutter, architects, of Boston. We hardly know whether to congratulate either Messrs. Wait & Cutter or the good people of Richmond on the result of a competition which we should have been glad to see very differently managed; but we can at least offer to all of them our sincere good wishes and hope that what we believe to have been a mistake in the beginning may be so far amended, as the work goes on, that the capital of the ancient State which all of us hold in so much regard may, after all, be adorned with a building worthy of its surroundings, and that the architects may find themselves encouraged to put forth such patient skill and effort as shall earn for them the highest praise of all who see their work.

A CORRESPONDENT of the *Metal Worker*, a chemist, whose attention had been attracted by the persistent assertions of certain manufacturers of wrought-iron stoves and furnaces that cast-iron articles of the kind were dangerous to use, on account of their property, when heated, of allowing carbonic-oxide gas to "pass freely" through their pores, recently undertook a series of experiments to satisfy himself whether this gas really did or did not escape through the metal of cast-iron furnaces and other heating apparatus. Among the various tests for carbonic oxide, he chose one which would detect with certainty one part in twenty-five hundred of air, and proceeded to apply it under as many different conditions as possible. Inquiry was made for houses in which the air was supposed to be contaminated by furnaces or stoves, and a considerable number of buildings were examined, some of which, as the writer says, contained as bad furnaces as could be found anywhere. The air in many of the houses was very unpleasant, and no doubt unwholesome, but its deleterious quality was in all cases due to something else than carbonic oxide, which, although the air at the very mouth of the registers was tested with great care, was not detected in a single instance. Whether carbonic oxide might not have been present in smaller proportions than one to twenty-five hundred is uncertain, no reliable test being known for smaller quantities, but as this quantity is regarded by most physiologists as entirely harmless, and is, at all events, less than the proportion usually present in rooms where cigars or pipes have been smoked, it seems to be plain that poisoning by the carbonic oxide exuded from the pores of cast-iron furnaces must be, at least, a very rare occurrence. To try the experiment in a different way, the *Metal Worker's* correspondent then had a stove constructed in such a way that plates of cast-iron of different thicknesses could be set in it, and a metallic funnel was arranged to draw off the air in contact with the plates, and convey it, by means of an aspirator, to a convenient place for testing. The stove was then heated with coal nearly to whiteness, the dampers were closed, so as to prevent the chimney draught from carrying off any

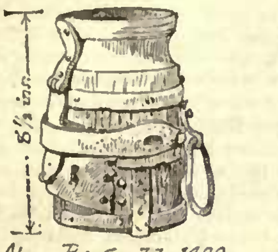
carbonic oxide which might be disposed to get out through the pores of the iron, and the air in contact with the heated upper surface slowly collected during an hour and a quarter. At the end of that time, an examination showed no trace of carbonic oxide in it. The experiment was then three times repeated, but the air was taken from the side plate of the stove, in contact with the hot coals. In the first case, the plate was three-eighths of an inch thick, in the second it varied from one-eighth to one-quarter of an inch, and in the third it was one-sixteenth of an inch, but in no case, although the plates were kept at or near white heat, could the smallest indication of carbonic oxide be found in the air which had passed slowly over them.

THESE experiments, although recent, and made in such a way as to seem particularly convincing, are not the first which have failed to confirm the theory that carbonic oxide could pass through cast-iron. It seems, from another letter in the *Metal Worker*, that the famous experiment of Deville and Troost was made by placing a closed cast-iron tube over a row of Bunsen burners, and keeping it at a white heat for some time. On cooling it, and examining the air inside it, a trace of carbonic oxide was found. No one else has, we believe, ever obtained the same result in repeating the experiment, and it is generally believed by chemists that the carbonic oxide discovered in the first trial, instead of getting through the pores from the outside, was formed in the tube, by the action of the oxygen of the contained air upon the carbon of the iron, but the publicity given to the supposed discovery by its announcement in the proceedings of the French Academy immediately created a demand for wrought-iron heating-apparatus, which the shrewd manufacturers of such objects have been only too ready to stimulate and supply, at a profit of many thousands, if not millions of dollars to themselves, and to the cost of their customers, whose dread of the purely imaginary evils of cast-iron furnaces has kept them for fifteen or twenty years contented with unscientific, inefficient and wasteful wrought-iron apparatus, at prices for which they could have purchased far better ones of the old kind. It is true that some of the best plate-iron furnaces provide an extent of radiating surface which gives them the same advantages that are possessed by the cast-iron ones, but this is done at great expense, and the heating part of most wrought furnaces consists simply of a short closed cylinder turned down over the fire, without the smallest attempt at economizing the heat of combustion, at extending the radiating surface to increase the quantity and reduce the temperature of the air delivered, or at presenting the radiating surfaces at advantageous angles with the direction of the currents of hot gas, all of which are regarded as important objects, by experienced and scientific manufacturers of heating apparatus, and are easily and cheaply obtained with cast-iron.

THE *Scientific American*, an excellent authority on such points, makes some comments upon a recent decision in a telephone suit which are of interest to those who use this great invention. The suit to which it refers was brought by the American Bell Telephone Company, in the United States Court in Pittsburgh, against the Western Telephone Company, to restrain the latter by injunction from infringing the patent rights claimed by the plaintiff. The argument for the defence would have been that the instrument used by the Western Telephone Company was substantially the same as that which was invented and described by Philip Reis, more than twenty years before the date of the Bell patent, and is now common property, but the court, after hearing the plaintiff's argument, refused to listen to anything whatever from the defence, saying that as the question at issue had already been passed upon by two eminent judges, it would not venture, especially upon so trivial a matter as a preliminary injunction, to reopen it. As we understand, the Bell Company has never denied that Reis thought out and described an electrical talking-machine long before Professor Bell turned his attention to the subject; but it claims that Reis's invention was based upon an erroneous principle, and that a telephone constructed in accordance with his theory could not be made to work; and on what appeared to be satisfactory proof of this, Professor Bell's patent, for an instrument that did work, was confirmed to him as giving him a monopoly for seventeen years of "the electrical transmission of speech," by any method whatever. The Western Telephone Company claims, however, in the present case, that telephones on the Reis principle will, and do, transmit speech intelligibly, and if this can be proved, as the *Scientific American* says, "the patent of Bell will be reduced to its proper rank: that of a subordinate improvement." As other telephones have been invented, notably that of Professor Dolbear, which differ entirely in principle from that of Bell, and are only kept out of the market by the decree which gives the latter control over all forms of electrical transmission of speech, the establishment of the practicability of the Reis telephone, and the consequent limitation of the Bell monopoly to a particular device, would naturally be followed by the introduction of many new, and probably improved forms of telephone, much to the advantage of the public. It is hardly likely, as the Pittsburgh case shows, that the decision of Judges Gray and Wallace will be questioned in the inferior courts, unless some new and very striking evidence should be brought forward; but, as the *Scientific American* points out, the Supreme Court of the United States has never yet passed upon the subject, and the question, if brought before it, would be decided upon its merits, without regard to the opinions of inferior tribunals. Whether the Western Telephone Company, or any one else, has confidence enough in the strength of its position to bring its case to Washington, or whether any controversy with the rich and powerful Bell Company would reach that stage before being settled by purchase or compromise, is doubtful, but we imagine that most disinterested persons would be glad to see the present telephone service improved and cheapened under the stimulus of competition.

A RATHER singular trial took place recently in England, which has furnished the text for many commentaries in the newspapers. It seems that a certain person owned a "desirable villa residence" in that sanitary Paradise, Croydon. The desirable residence, which went under the attractive name of Abbottswood, was leased by the owner to a Mr. Saunders, at a rental of four hundred dollars a year, with the assurance that the house was "in perfect sanitary condition," and that the plumbing had been carried out under the supervision of the local authorities. Not long after the tenant moved into the house, his gardener, cook, and stepson were taken ill, and last of all his wife, a person with an income of five thousand dollars a year for life, was attacked with "blood-poisoning," and died. In some way, the details of which are unfortunately not given, it was discovered that the demise of Mrs. Saunders and her income, together with the afflictions of the rest of the family, were "caused by faulty drainage arrangements," and suit was brought against the owner of the house for damages. The local health officials testified that they had inspected the drainage of the house after its completion, "and had not raised any objection to it," but the jury, to whom, as to Englishmen in general, the loss of an income secured by marriage probably appeared an unbearable calamity, returned a verdict that the owner of the house had "induced the plaintiff to take it by false and fraudulent statements," and condemned him to pay to Mr. Saunders ten thousand dollars as damages, besides eleven hundred more to the court in the form of costs. There are several remarkable things in this case, about which we forbear to say anything, but it is worth while to call attention to the fact that the implied, if not express certificate of the Croydon inspectors that the plumbing and drainage was perfect seems to have availed the owner nothing in his defence against the enormous claim made upon him. We have often heard it said that building and plumbing laws relieved architects as well as owners who built under them from all responsibility; and that the same power which took away discretion from them, and vested it in an inspector, virtually guaranteed the competency of the inspector, and the correctness of his judgment, as well as the adequacy of the laws; but this case shows that it is the owner who must shoulder the consequences not only of his own acts, but of those of the legislators who make the statutes and the officers who execute them. In most cases like the present one he would be perfectly ignorant about the drainage works of his house, and, relying upon the favorable action of the official inspectors, would have asserted it to be in proper sanitary condition with perfect good faith, and it is rather startling to find that in spite of all this he would stand in constant risk of being ruined if a rich female should happen to die in his house of any of the numerous diseases which popular fancy attributes to the effect of "sewer-gas."

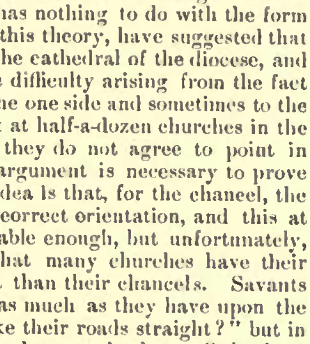
PECULIARITIES OF COUNTRY CHURCHES IN ENGLAND. — II.[1]



Alms-Box. Date 1490. Brownes Hospital, Stamford. Lincolnshire: England.

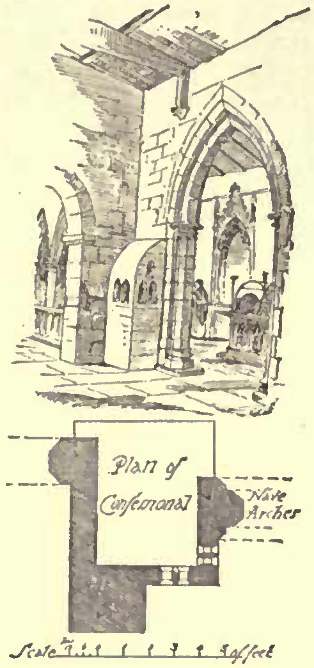
ONE feature that has given rise to a great deal of discussion and argument is that of the chancels whose side walls do not run in the same direction as the walls of the nave or aisles. I think I am correct in saying that there are more churches with "crooked" chancels than with straight. Sometimes the direction in which the chancel slopes is to the north, sometimes to the south, of east, occasionally it is so slight that it can hardly be noticed from the interior, and one has to mount to the ridge of the nave, and look along the two ridges together before one can be sure whether the chancel slopes or not, for when the curiosity is aroused on a subject like this, it takes every opportunity to endeavor to satisfy itself as to the fact. Some chancels have so decided a slope that the attention is called to it instantly. All sorts of theories have, of course, been submitted in explanation; some of them most ingenious, but all more or less fallacious, as we shall see. The one held by the greatest number of people is that the deeply-religious masons intended the sloping chancel to represent the bowed head of the dead Saviour on the cross; but if that were the case, surely they would have decided towards which side the head would have fallen, and would have made all the chancels incline the same way. If the chancel represents the head of the Saviour what is there to show the head of the cross; and why should only the head be indicated and no other part. It would have been easy to add little chapels here and there to mark the position of the sacred limbs that projected beyond the straight lines of the cross, and there is no less reason for so doing, than for marking the inclined head. Again, the chancels of many churches which are not cruciform on plan, slope, and there is no sense in making a "fallen head," where the rest of the church has nothing to do with the form of a cross. Others, dissatisfied with this theory, have suggested that the chancel always inclined towards the cathedral of the diocese, and this they thought would get over the difficulty arising from the fact that the inclinations is sometimes to the one side and sometimes to the other; but it is only necessary to look at half-a-dozen churches in the same diocese, when it is seen that they do not agree to point in the same direction, and no further argument is necessary to prove the fallacy of that theory. Another idea is that, for the chancel, the builders were more careful to obtain correct orientation, and this at first sight may be considered reasonable enough, but unfortunately, upon examination it is discovered that many churches have their naves more nearly due east and west than their chancels. Savants have exercised themselves upon this as much as they have upon the question, "Why did the Romans make their roads straight?" but in neither case has a satisfactory solution been arrived at. Only three years ago a learned man, in connection with the London University, gave out his theory that the Roman roads were straight because the chariots were difficult to turn, and that consequently to obviate this the roads were made without curves. There are exceedingly simple answers, I think, to both these questions. The Romans had common sense enough to know that if they wanted to reach a particular point the shortest way there was to go straight; and as to the question about the chancels, most probably the builders erected them under the impression they were continuing in the same lines as the nave; but did not trouble themselves to set their work out exactly, and so it is to chance that we owe this peculiarity, and so there is no symbolism in it at all.

Let us now turn our attention to the internal arrangements, and we shall find some very curious details; the more interesting because they are less known. In the neat little church of Burton Joyce in Nottinghamshire, the chancel is added to the body in an unusual manner. The body consists of a nave with three arches, and an aisle on either side. The south wall of the chancel is a continuation of the line of arches of the south side of the nave, but the north wall is about five feet to the north of the nave's other arches; so that the chancel is five feet wider than the nave, and the additional width is all on the north side. The chancel arch therefore is at one side of the centre line, and a wall pierced with a pointed arch separates the addition of the chancel from the north aisle. This end of the north aisle was once used as a chapel, there being a piscina in the pier that supports the first arch. At West Tanfield, Yorkshire, the church contains a large niche with a small opening at the side like a confessional in the pier supporting the first arch on the north side of the church. It is a very unusual position for a confessional, indeed to have a confessional built in a wall is very uncommon, but no one knows the original purpose of the feature. In this church are the tombs of the great Marmion family, the subject of the poem of Sir Walter Scott, and they stand near this "confessional" and I am inclined to think that it must have been used as a watch-place by the pious monks who chanted the requiems for the repose of the Marmions' souls.



West Tanfield, Yorkshire.

"Leper squints" and "dole windows" or doors are comparatively common, but there are very few places now where a weekly or monthly dole to the poor inhabitants is still distributed by bequest. At Sawley, in Nottinghamshire, there is a monthly dole of bread to the villagers, but it happens that there is no "dole door" in the church, and on the Saturday before the dole Sunday loaves of bread are piled up inside the church, ready to be given away on the morrow. The leper windows or rather "slits" are of a very early date, and are more common in churches of the eleventh, twelfth and thirteenth centuries, than in those of later date. Their use was for lepers who were forbidden to mix with their fellow men, and were consequently unable to see anything of the worship excepting from outside the buildings. A "squint" is a narrow slit cut or built at an angle through the wall, large enough for one person at a time to look through and get a peep at the altar. They are sometimes found in out-of-the-way angles of the chancels, behind buttresses and sometimes in the plain surface of the walls, no particular position having been assigned to them. Leprosy was rampant in the eleventh century consequent upon the great consumption of pork, the disease gradually dying out as greater attention was given to diet and cooking, and as the practice brought over by the Normans of eating vegetables as an accompaniment of meat became general. "Squints" are sometimes cut in the side of the chancel arches to enable those sitting in the aisles to obtain a view of the altar; there is an example of this in the church at Hasely, Oxfordshire, where also "squints" are used for the admission of light to the rood-loft steps in the thickness of the wall.



West Tanfield (Confessional), Yorkshire.

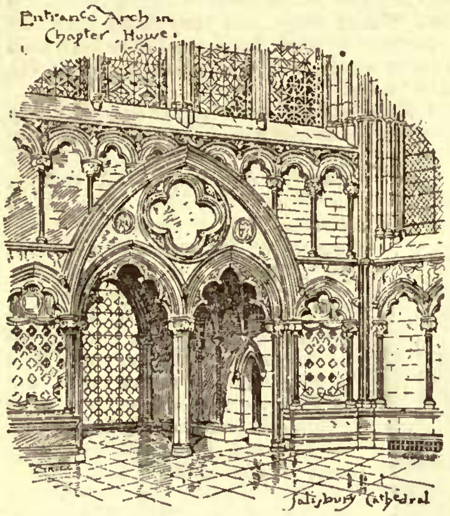
"Easter sepulchres" are to be found in many churches. These are carved representations of the Resurrection of Our Lord, treated in various ways. One in very perfect preservation is at Hawton Church, Nottinghamshire, which owes its present perfection to an accident: it was completely buried with plaster, by the parishioners to hide it from the rude soldiery of the Reformation, and has ever since for more than three hundred years been forgotten, until when the church was being restored it was accidentally discovered. It consists of a base three feet high, divided into four panels, in each of which is carved in bas-relief, the figure of a Roman soldier fully armed, sleeping as he sits on his heels, or otherwise crouches in a somewhat constrained position. Above this base is a recess of about eighteen inches deep, four feet high and five feet wide, in front of which in a line with the base is an arcade of three arches, the central one being three times the width of the other two. In the wall at the back immediately behind the narrow arch on the left-hand side is a low archway like a piscina, representing the entrance to the tomb. On the wall at the back of the other two arches is the representation, also in bas-relief, of the meeting of Our Lord and Mary in the Garden. Above all this is some rich and delicate carving, and still higher is a group of disciples "gazing up into heaven," which is represented by a foliated string-course, in the centre of which are to be seen the feet of the ascending Saviour as He passes out of sight. This particular "sepulchre" dates from 1420.

Niches and brackets for figures of the Virgin and of the patron saints of the churches are placed in every conceivable position, from a niche over the entrance doorway to brackets on either side of the altar at the east end. One of the nave pillars in Dorchester Church, Oxon., has a very heavy bracket richly decorated, originally supporting a figure of the Virgin and child. It is in an unusual position, being only four feet from the floor, and it may be said to have its origin in the arrangement so common on the Continent of Europe of placing figures of Saints half-way up the nave pillars.

[1] By R. W. Gambler-Bousfield, A.R.I.B.A., A.A.I.A. Continued from page 304, No. 496.

TAKING DOWN A CHIMNEY. — A mill-chimney in the United States was recently taken down in the following manner: The proximity of buildings limited it to falling in one direction. About eight feet from the ground a recess was cut across the side of the chimney, and heavy timber shores braced against the chimney. The chimney was cut away beneath the side supported by this timber. Holes were bored in the timber midway between the ends, and illuminating coal-oil poured into these holes until the timber was thoroughly impregnated with oil. It was then set on fire, and when too weak to support the load of half the chimney, it fell in the desired direction. — *Engineering.*

GOSSIP ABOUT SALISBURY.



IN a valley at the confluence of three small rivers, the Upper Avon, the Wily and the Bourne, surrounded by fertile meadows, and with a background of half-cultivated chalk downs, lies the old city of Salisbury. It is said that the reason for vacating Old Sarum was the want of water, and if this be true, certainly it accounts for the choice of the present site. Before drainage became the fashion, there were innumerable streams all over the town, as the name of one of the principal streets bears witness, the "Canal." Indeed, so watery was it that it was absurdly likened to Venice. There is an epitaph to Mr. Francis Hyde, who died while Secretary to the British Embassy at Venice, which illustrates this: —

> "Born in the English Venice, thou dost lie,
> Dear friend, in the Italian Salisbury."

Salisbury is a picturesque old town of red-bricked, gable-roofed houses, which, though fast disappearing, are being replaced by a similar style of architecture. The new bank in the market-place is a fine building, with barged walls and high, pitched roof. The Halle of John Halle (now a show-room of Mr. Watson's china-shop) is a banqueting-hall built in 1470 by J. Halle, a wool-stapler in the reigns of Henry VI and Edward IV. It has an open-timber roof, the compartments between being ornamented with fans of white plaster. At the south end is a large oak screen.

The George Inn has an old covered gallery round the inner courtyard, which is entered by an arch from the High Street. Here Pepys wrote in his diary "that he lay in a silk bed and very good diet," but he bitterly complained of the exorbitant charges: "7*s.* 6*d.* for bread and beer;" so "mad" was he thereat, that "he resolved to trouble the mistress about it and get something for the poor." ("*Pepys's Diary*," II, 237–238).

St. Nicholas Hospital, founded in 1227 by Ela, widow of William Longespée, Earl of Salisbury, has been restored by Mr. Butterfield, and is an example of pure Early English. St. Edmund's is an interesting church of the Perpendicular period, and has traces of fresco paintings. Some of these have unfortunately been repainted, with disastrous results. The crude ideas of fifteenth-century painters upon the "Last Judgment" are curious, when they are to be seen in their primitive condition, as in the Campo Santo at Pisa; but "restored" and made new and bright, they become simply ludicrous. Witness, here, the clean, pink bodies rising from green, grass-grown tombs.

Persons interested in archæology and prehistoric men, birds and beasts, should visit the Museum in St. Ann's Street, founded by the late William Blackmore, and arranged by the late Edward Stevens, both natives of Salisbury. It contains objects illustrative of the natural history of the neighborhood: archæological specimens, etc., found during excavations; fossils, arrow-heads, knives, etc.; also models of the lake-villages of Switzerland, implements in stone and bronze, and weapons, etc., used by modern savages. An important part of the collection was formed in various parts of America, including Peru, by Mr. Squier and Dr. Davis, and was purchased by Mr. Blackmore during one of his many visits to the United States. Americans will see their stars and stripes amongst the armorial bearings of the countries represented in the Museum, which ornament the walls beneath the mullions of the windows. Visitors who have not seen the collection of incised drawings or carvings in bas-relief upon bones in the museum at St. Germain-en-Laye, near Paris, would do well to study those on view here. They are from the bone caves at Le Moustier, and about Abbeville, France, and are as perfectly drawn as the best artists of the day could do them; yet nothing is known of these prehistoric sculptors and draughtsmen, and we are expected to believe that they were savages living in caves! Perhaps it is possible for a scientist to credit this; but can an artist, knowing as he does, that no extant savages have any idea of drawing? And yet these reindeer, these ibes, even the famous mammoth himself, are more perfectly formed than they would be by the average student of an art school!

The "Church House," near Crane Bridge, a building of the fifteenth century, is being admirably restored. Until lately it was used as a workhouse, but it belonged formerly to Mervin, Lord Audley, who suffered death on Tower Hill in 1631. The library has an open-timber roof and barged walls, with a gallery opening from a turreted staircase. Some stone fireplaces of the same period have been given by Lord Radnor and Miss Grove, which add much to the beauty of the rooms. It is altogether an excellent example of a house of the period.

But it is the cathedral which is the great object of interest in a visit to Salisbury. On entering the quiet and peaceful close by one of its old covered gateways, one gets a fine view of the church, surrounded by the smooth green turf, on which are some magnificent old elms. Perhaps the best point of view is the northeast corner. The exterior is one of the finest of the English cathedrals', and the spire is certainly the most graceful one in the world. The See of Sarum was founded A. D. 634 by a Genoese, but the seat thereof was then at Dorchester. It was divided and subdivided from time to time, until in 1075 it became settled at Old Sarum, St. Osmund, a nephew of the Conqueror, being its second bishop. He completed the first church which Herman had commenced, and caused the "*Use of Sarum*" to be compiled. He died in 1099 and in 1456 was canonized; his remains having been transported to the Lady Chapel of the new church in 1226. Bishop Roger, a Lord Chancellor, Treasurer and Chief Justice, was succeeded by Jocelin de Bohun, a member of the noble family which supported the Empress Matilda in her contests with King Stephen. This bishop also opposed Thomas-à-Becket, and adhered to the king's party (Henry II), having a great deal to do with the drawing up of the "Constitutions of Clarendon," for which the archbishop excommunicated him. The seventh bishop, Richard Poore, was the founder of the present church, and before his translation to the See of Durham, he saw the new cathedral sufficiently advanced to be consecrated; *i. e.*, the Lady Chapel, which was finished five years after the laying of the foundation stone, viz., in 1225. The name Poore, is by some persons supposed to be equivalent to "poor," but this must be an error, as the Bishop's brother Herbert is described as "*dives*," rich, and he himself gave an estate to his new cathedral. The name probably comes from the Norman equivalent of the Latin *puer*, a boy. *Puer Anglicus* was an old designation of the Prince of Wales, just as *Infante* is still used in Spain; hence *le poer* meant a younger son or thane, the latter being the title of the lesser nobility in Anglo-Saxon times. *Cild* in Anglo-Saxon had the same meaning, and thus we have, in Dorsetshire, Child-Okeford and Poor-Stock, places held originally by a "king's Thane," or one of the lesser nobility.

Tradition gives Elias of Durham as the name of the architect. He was a canon of the cathedral during Poore's time, and held a prebend, and the "*Martyrologie Book*" of Salisbury speaks of him as having been "director" of the new church for twenty-five years — this would probably mean "clerk-of-the-works" in modern language. That he was the builder of the original house in the close called "*Aula Plumbea*" or "*Leden-halle*" is certain from the "*Book of Evidences*" amongst the bishop's monuments: "*Scriptura de domibus de Leden-halle per Eliam de Derham sumptuose constructis.*" Moreover, this same Elias accompanied Poore to Durham, where the bishop, finding a Norman apsidal termination to the cathedral, substituted an Early English one called the "Chapel of the Nine Altars." The resemblance in style between this and the Lady Chapel of Salisbury is thought to be some proof that both may have been the work of the same architect.

One of the reasons for considering the exterior the finest of all the English cathedrals is its peculiar completeness. Few other churches are entirely of one period; but here the builders never seem to have changed the original design, as may be seen by the regularity of the lines of the masonry, the stones seeming to be of the same size, and to run in even bands all round the church; it is impossible to see where they left off. Another peculiarity is the double transept, the eastern one being smaller than the western. The tower and spire are supposed to have been built about 1290–1320, being of the best Decorated period; but whether the original architect meant to add a spire or not, is doubtful. That he intended the lower story of the tower to be open to the church is certain, as, above the arches upon which it rests, and now concealed by later groining, is an arcade which was formerly a series of detached Purbeck columns round the whole of the interior. Probably a lantern, as at Ely, was the original idea. The spire is four hundred feet high, being the loftiest in England. St. Paul's, London, is three hundred and sixty-five feet, while Amiens, France, is four hundred and twenty-two feet (it is a *flèche* rather than a spire) and Strasburg is four hundred and sixty-eight feet. Originally there was a bell-tower detached from the church, but this was destroyed by the vandal James Wyatt (1782–90), who was let loose upon the church to destroy and mutilate it to his ignorant heart's content.

The west front was probably the last part of the building completed, and is a mere mask, not being in any way a finish to the nave. It is a mass of niches with figures of saints, most of them new. There are three doorways, over the central one of which is an old group of the Blessed Virgin and child. A great many cavities for dedication-crosses remain on the external walls; these were filled with metal and anointed with chrism on the hallowing or consecration of the church. The north porch is exceedingly beautiful; it has a double arcade of trefoil arches supported by polished Purbeck marble shafts. The nave is eighty-four feet high and eighty-two feet wide (Westminster Abbey is one hundred and three feet high and seventy-five feet wide, which accounts for the superior elegance of the proportions of that church above all others; York, on the other hand, is ninety-three feet high and one hundred and six feet wide). The nave is divided into ten bays, the shafts being a central stone column with clustered Purbeck marble ones round it. Above runs a

beautiful triforium, open to the roofing of the aisles, a succession of flat-pointed arches subdivided into four smaller ones, ornamented with trefoils and quatrefoils. The clerestory consists of triple lancet windows.

The fault of the church lies in its illumination, all the aisle windows being very large double lancets. Yet in this the old builders showed their wisdom, since, having to construct a church in a foggy, damp climate, they made the windows as large as possible, in order to get the greatest amount of sunlight. But in the old days they were doubtless filled with stained glass, and if this could be done now, and upon some system, with such glass, for instance, as is the glory of the Sainte Chapelle in Paris, the effect would be gorgeous. As it is, the windows which have been put in are not of the best character, and no harmony exists in the designs of the different ones. The church was restored some few years ago, and unfortunately the color which is supposed to reproduce the fragments of old painting remaining in places is very weak and *faded*. It is indeed remarkable that whereas a groin of old paint is *scarlet*, the modern imitations are *pink*, and so on with the other colors. The Sainte Chapelle has been more fortunate in its restorers; the colors there are bright enough to stand for years; whereas one or two decades will make those of Salisbury scarcely perceptible. Then again, the stone having been scraped and the Purbeck columns polished, the whole church has a new and clean, a black-and-white appearance, which rich-colored glass would tone down. While speaking of the windows, it may be well to point out the one in the south aisle of the choir, put up to the memory of Lady Radnor. It is of *grisaille*, with eight distinct figures in color, but a rich, golden hue pervades the whole, and the harmony is excellent. The designs of the figures, which are exceedingly graceful, are by Mr. Holliday, and the execution by Mr. Powell. Another window from drawings by Mr. Burne Jones, is less happy in color, and the design is confused. In the south transept is a window made up of old *grisaille*, and there are a few pieces of the thirteenth and fifteenth centuries in the great west window.

A curious feature of this cathedral is the stone bench which extends on each side of the nave, supposed to have been erected to strengthen the foundations, as all the pillars rest upon it. That the ground is or was not of the firmest character is proved by the sinking of the shafts under the tower, which causes the spire to be some twenty-two inches out of the perpendicular. Over the entrance to each of the transepts, also, extra arches were inserted in the fifteenth century, to strengthen the tower and roof. The pulpit and the chancel screen are new, the latter, with all the rest of the iron-work, in the worst possible taste. It is mean in design, and gilt and silvered, giving it a common and trumpery appearance; and the same must be said of the altar standards. A great deal of the old painting remains on the roof of the choir, probably dating from the thirteenth century, and it would seem, from the central subject being "Our Lord in Glory," that the altar must have been originally under this, on a line with the centre of the choir transepts, instead of in its present position farther east, and close to the entrance of the Lady Chapel; but on the other hand, it is known to have been in its present position in 1540. It is unfortunate that the restorers who were scandalized by the old position of the organ on the top of a heavy wooden screen should have placed the new one in so prominent a situation as to fill up an entire bay on each side, and project into the choir, thus completely spoiling the vista.

On the north side of the choir is the beautiful chantry of Bishop Audley, who died in 1524. It has a fan-vaulted roof and has been colored. On the opposite side is the Hungerford chantry, erected in 1429, and desecrated in 1778 by Lord Radnor, who removed it from its original position, and converted it into a pew, rarely used, one would suppose, for the occupants would have to sit up in high chairs (still there) behind an iron railing. This is by no means an uncommon instance of the use that tombs were put to in the last century. At Tong Church, near Shiffnal, in Shropshire, an entire chapel is occupied as a pew. It is separated from the church by an open arcade and doorway, and, to make it comfortable, the owners have placed a stove in it, which is poked and raked out during service!

The Lady Chapel is exceedingly beautiful, being composed of slender black marble columns supporting the groined roof, the largest of which only measure nine or ten inches in diameter, though they are thirty feet high. Under the windows is a series of niches, the canopies of which formed part of the Beauchamp Chapel, destroyed by Wyatt; as, indeed, did also the mouldings which go round the north and south sides of the chapel. On the north side of the altar is a recess in the wall, divided by a shelf into two parts, with the remains of hinges showing that there was formerly a door. Two similar niches in the same position are to be seen in the Morning Chapel, and no doubt they were credences or tabernacles for the reservation of the Blessed Sacrament.

The monuments were all more or less destroyed, or displaced by Wyatt, and the placing of one between each bay of the nave upon the stone bench is entirely his arrangement. Some are interesting, but there are none to be compared to those in Winchester Cathedral, though doubtless the Beauchamp chantry was as fine before it was demolished. Taking those in the nave in order, and beginning at the south side of the next door, No. 3 is a slab with the effigy of a bishop in full canonicals, and surrounded with a border of birds and foliage. It is supposed to have been brought from Old Sarum, and to have covered the tomb of Bishop Jocelin, although competent authorities cannot make up their minds whether this or the next are respectively that of Bishops Roger and Jocelin. The tomb of William Longespée (No 10), still retains a good deal of the old coloring. The effigy of the Knight is in alabaster, and rests upon a tomb of exquisite diaper-work painted in tempera — erroneously described in "*Murray's Handbook*" "as painted on linen." Longespée was a son of Henry II and Fair Rosamond. No. 11, that of Sir John Cheyney, is a beautiful tomb of the fourteenth century. Sir John was of extraordinary size and strength, as was proved when Wyatt removed the tomb; a thigh bone being found in it which measured twenty-one inches [?31]. He was standard-bearer to Henry of Richmond, at the Battle of Bosworth, and was unhorsed by Richard III in the desperate final rush, when the King, killing Sir William Brandon, and aiming a savage blow at Richmond himself, was thrown from his horse and killed. No. 17, is that of William Longespée, the second Earl of Salisbury, and son of the former earl. He is cross-legged, and in chain armor, after the manner of a Crusader. He went twice to the Holy Land, in 1242 and in 1249, when he was joined by St. Louis of France. The next year he was killed by the Saracens, and buried at Acre. Beyond this tomb is the one of the so-called Boy-Bishop; but whether it represents a chorister who died "in office," or is simply a miniature effigy of a real prelate, is doubtful. It is by no means uncommon to find these diminutive effigies. One still exists at Winchester Cathedral of about the same date (Bishop Ethelmar, 1260); and others are to be seen at Abbey Dore Church (a bishop fourteen-and-a-half-inches long); at Horsted Keynes, Sussex (a cross-legged mail-clad knight); and at Haccombe, Devon (a civilian); and it is thought that they were used to cover the burial places of portions of the body, such as the heart. The custom of burying different parts of the body in different places was very prevalent in the Middle Ages. Blanche d'Artois, wife of Edmund, Earl of Lancaster, who died in 1302, and whose body was buried in Paris, and her heart in the church at Nogent l'Artault, is commemorated at St. Denis, near Paris, by a diminutive effigy. Many of these smaller statues now remaining, have their hands crossed over their breasts holding a heart, which may also be additional evidence to the supposition that it is the heart that these little statuettes commemorate. However, this is all guesswork, and the tomb may really represent one of the boy-bishops, though why in that case it should not have been life-size, is difficult to understand. Be this as it may, there is no doubt about the fact that every St. Nicholas Day (December 6), the choir boys elected one of their order to represent a bishop, hence the term *Episcopus Puerorum*. From the feast of St. Nicholas to that of the Holy Innocents (December 28), he bore the name of, and wore the vestments of a bishop; while the other acolytes played the part of prebendaries. On St. Nicholas day a grand procession took place. Entering the church by the great west door, and passing up the nave to the altar, the bishop took his seat and the mass began. It must have been a fascinating sight, these children clothed in diminutive vestments, mitred, and bearing the crozier, surrounded by canons and minor canons bearing lights and incense; and the idea seems to have sprung from the words, "out of the mouths of babes and sucklings hast Thou ordained strength" in the collect of the Feast of the Holy Innocents; for it is difficult to believe that it was a custom of the Primitive church, so entirely does it seem to be in accordance with the spirit of the Middle Ages. A full description of the ceremonies is to be found in the "*Processional of Salisbury Cathedral*," where also the service is printed and set to music. Of course it led to grievous abuses, processions and begging about the town after the church ceremonies, being the common practice; and in 1542 it was forbidden, and although partially revived during Mary's reign, it was finally abolished under Elizabeth. This strange custom was by no means confined to England. There are accounts of it being in vogue in many French towns. At Roye in 1527, at Amiens, at Toul in 1500, at Caen, earlier in 1256, at Aix it survived till 1543, while in Germany a similar custom seems to have prevailed. At Bayeux it was "*très solennelle*," and in the Inventory of the Treasury in 1476 are these items: —

"2 *mitres du petit Evêque;*
Le baton pectoral du petit Evêque;
Les mitaines du petit Evêque;
4 *petites chapes de satin vermeil à l'usage des enfans de chœur à la fête des Innocens.*"

Some bas-reliefs by Flaxman in the northwestern transept, do not seem to bear evidence to the great reputation of the sculptor; they are stiff and graceless, and seem to be proof that a man may be a great artist in minute work, and utterly fail when he attempts the grand. In the north aisle of the choir is one of those figures of a skeleton, supposed to be the effigies of persons who tried to fast forty days in imitation of our Blessed Lord. This, of one Fox, is succeeded by that of Dr. Bennet, precentor of the cathedral from 1561–64, of whom a similar story is told.

The modern tomb of Bishop Hamilton by Sir G. Scott, is handsome in its way. But far more beautiful, and perhaps the most interesting in this church is that of Giles de Bridport, during whose prelacy the cathedral was finished. It consists of a canopy, supported by open arches with quatrefoils in the heads; underneath rests the effigy, at the head of which are small figures of angels censing. Each arch is sub-divided by a central single shaft, and springs from clustered detached shafts. A triangular hood-moulding with crockets and leaf finials projects above each side. The sculptures are remarkable, and are supposed to represent events in the bishop's life. Both sculptures and architecture resemble the Chapter House.

The cloisters are among the finest in England, being in thirteenth-century work, and equal to the Perpendicular ones at Gloucester. The windows are divided by arches sub-divided by a slender shaft, and have a six-foiled opening above. In the centre of the quadrangle of turf are two cedars; and all about are simple little square stones, with here and there a wreath or cross of flowers — sole records of the resting-place of those who die in the close. It is probable that the cloisters were built between 1260–84, and the Chapter House somewhat later, in the reign of Edward I; for in 1854, during the restorations, many coins of that reign were found amongst the foundations.

The Chapter House contains eight windows between an equal number of buttresses, and divided into four lights with quatrefoil tracery. Below the windows is an arcade in the spandrels of which is a series of sculptures in high relief, representing events in sacred history from the Creation to the Declaration of the Law by Moses; they have been entirely restored and colored. Here again is a resemblance between Salisbury and the Sainte Chapelle; but the sculptures in the latter have been only partially restored. The French architects often leave a portion of the old work as they find it, restoring the rest, which is an excellent plan as it enables the student to study old work. Another plan they carry out is to place the old work in a museum — in Paris at the Hotel Cluny — or in the adjoining garden, and replace it in the church by new. This was done at St. Germain des Prés, and is a far more sensible plan than leaving old work to be restored and colored. There is a great similarity between many details of Salisbury and the Sainte Chapelle, as for instance the tracery of the windows: in fact the two churches are of about the same date, Salisbury 1220–58, the Sainte Chapelle, 1245–57. Below the arcade runs a continuous stone seat. The central shaft is clustered, supporting a fine groined roof. The vestibule contains some un-restored sculptures, which fill the voussoirs of the arch of the doorway. They represent the virtues, trampling upon the vices. The figure in the niche over the entrance is probably that of the Blessed Virgin. Mr. Burges says of these figures: — "They are of the very highest class of art, and infinitely superior to any of the work in the Chapter House, the only defect being in the size of the heads. Probably this was intentional on the part of the artist. The intense life and movement of the figures are deserving of special study." The height of the building is fifty-two feet to the vaulting.

Passing out of the close, the visitor should notice the many charming houses round the cathedral. The Poultry Cross is quaint, but has been too much restored; it is fifteenth-century work, octagonal, open at its six sides, with a central shaft supporting a canopy and a finial; it is of the same date, but not so fine as the Chichester Market Cross.

S. Beale.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

A CHAPEL OF BORDEAUX CATHEDRAL, FRANCE.

THE typical arrangement of the eastern end of a French cathedral is made up of five chapels radiating from the central sanctuary at the end of the choir, a polygonal system of planning which brings out many beauties of Gothic composition never found in the more severe rectilinear methods of the English Gothic. Each chapel of the *chevet* is a kind of bay between the main buttresses of the choir vault. The drawing of a chapel of the *chevet* at Bordeaux is a fair example of this feature of the middle-pointed or geometric age (thirteenth century).

The cathedral itself, dedicated to Saint André, is a fine structure, with a great nave without aisles, one of those interiors which in their adaptability to modern congregations reproach the timid modern designers of three-aisled churches. Externally the most striking features are two towers with spires to the north transept (very effective, although in an unusual position) two others, without spires, to the south transept, and (after the fine *chevet*) a well-proportioned tower, with a modern spire, standing detached at the east end. All have been well restored, as indeed have nearly all the old French churches. It is hard to say whether they look better for it, the partial decay is so picturesque; but it is a necessity if the old beauties are to be preserved. There is also some very fine stained glass at Bordeaux.

The sketch of a door is from Limoges Cathedral, taken as a specimen of the style. The edifice is a noble work of the thirteenth century, not of any great size, and having only two bays of the nave originally built. But at the time of the writer's visit the completion was in progress, and doubtless by this date is accomplished. All the work is in a hard granite, and the fair amount of elaboration is therefore an expensive work.

R. W. Gibson.

COMPETITIVE DESIGN FOR A CHEAP STABLE SUBMITTED BY "*At the Eleventh Hour.*"

Silas O. Smith, of South Orange, N. J., says he will build such a stable as is here presented, with the man's room cased up in wide pine boards; with plain staircase, and turned chestnut posts to stalls; stall-partitions, 2″ matched spruce; iron gutter leading to manure-yard, iron mangers; stalls lined with pine boards 5′ high; harness-room cased in pine, with hooks, etc.; stable floor of 2″ spruce, carriage-room floor, ditto; carriage-room entirely unfinished, no side casing or ceiling; second story floor of matched pine boards; central matched-pine partition separating stable from carriage-room, and hay-loft from stable-loft, grain-bins, grain-chutes, mixing-box, etc.; on the exterior, cover roof and walls with shingles (rough sawed pine) over 1″ x 2″ strips nailed to studs and rafters; battens and 1″ x 10″ vertical boarding below sills; cornices, mouldings, finials, etc., as per detail; the timbers to be 3″ x 12″ joists, 4″ x 4″ posts, 2″ x 4″ studs, 2″ x 6″ rafters, all set 16″ on centres, and the exterior wood-work to have two coats of Cabot's creosote stains; all complete as above, and in many other respects not herein described specially, but such as are usual for a building of this kind, for the sum of fourteen hundred dollars, and be glad to get the job.

In regard to the mason-work, "*At the Eleventh Hour*" has in mind a client with plenty of field stone on his place, so that the stone chimney would not be such an unwarrantable affair as might be supposed at first glance. Such a chimney has been laid up for $75. The trench wall for foundations would also not cost much, say, $80, but piers could be used at a less cost. The roadway in front is not included. Total cost, therefore, is reckoned at $1,555.

"*At the Eleventh Hour's*" client likes a harness-room separate from stable but easily contiguous to carriage-house. He sometimes takes a cigar in this cozy little haven, and hence the open fire. The man has access to stable from staircase without disturbing the big doors, and is able in his room to be aware of any disturbances among his charges below. The rear door allows access to carriage-room from either side, and enables vehicles to drive right in under cover at once; for even though a carriage and horses (24 feet over all) were to drive in, the rear would be covered by the hood over front door.

VIEWS IN THE LIBRARY OF GEORGE E. LEIGHTON, ESQ., ST. LOUIS, MO. MR. HENRY G. ISAACS, ARCHITECT, ST. LOUIS, MO.

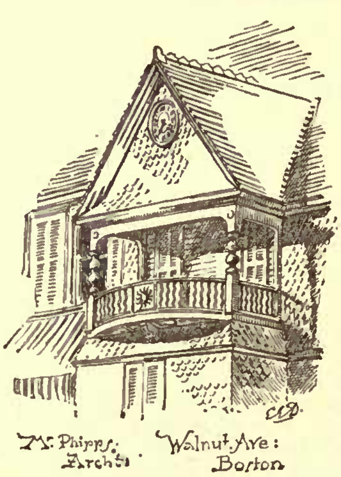
GABLES AND GABLE-ENDS IN AND ABOUT BOSTON, MASS.

OFFICES OF THE STANDARD OIL COMPANY, PITTSBURGH, PA. MR. W. S. FRASER, ARCHITECT, PITTSBURGH, PA.

COMPETITIVE DESIGN FOR A CHEAP STABLE SUBMITTED BY "*Ad rem.*"

A contractor of Newark, N. J., places the cost of this building at $1,490.88.

COMPETITION FOR A DESIGN FOR A MEMORIAL TO GENERAL GRANT.



THE feeling that prompted us to suggest a competition for a design for a memorial to General Grant was that here was an opportunity which many architects and sculptors would be glad to seize as a means of showing a generous, public-spirited willingness to give expression to the general desire to commemorate the Nation's regard for one of its greatest citizens.

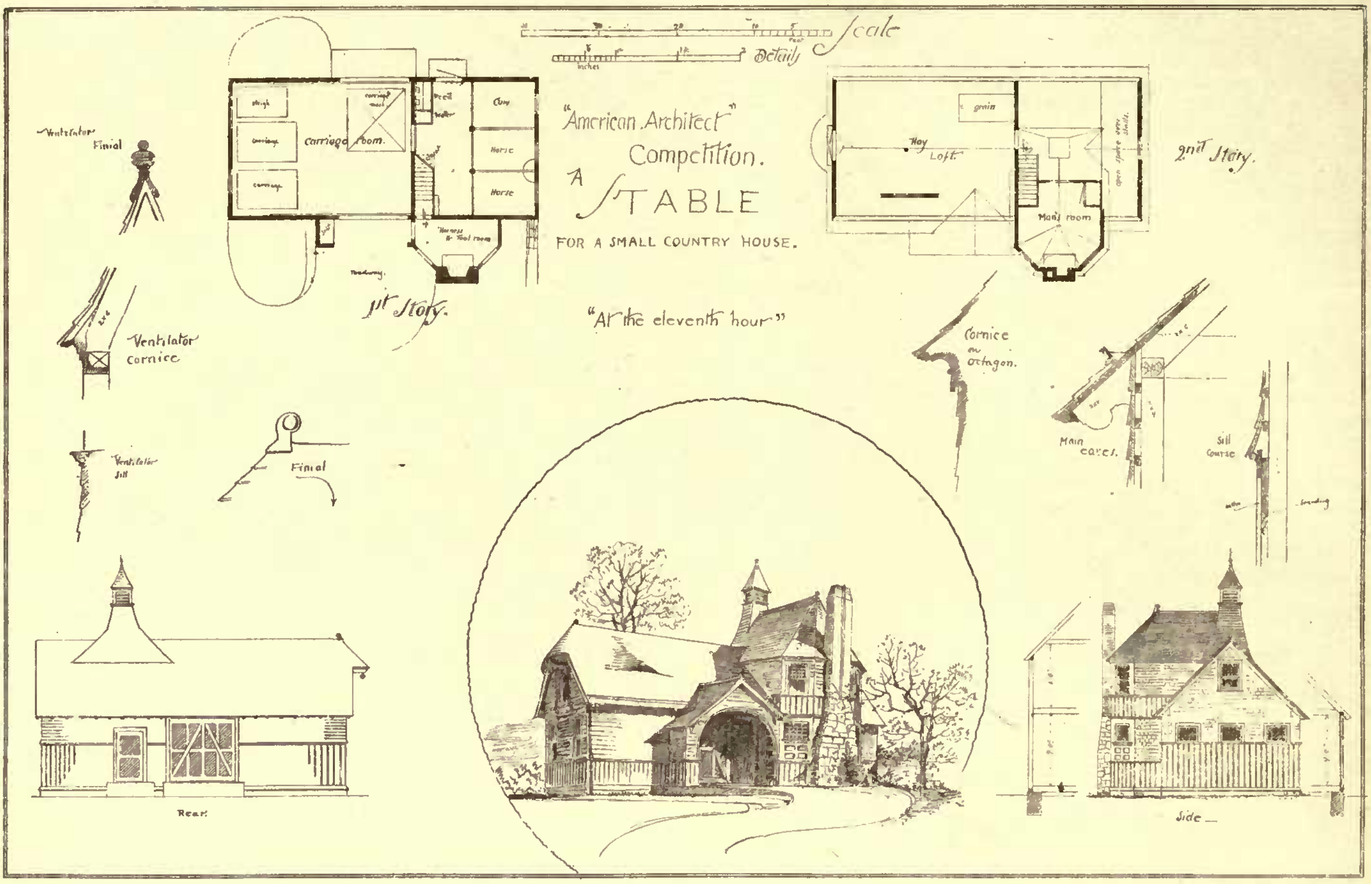
We suggested, not a national monument, but one which might be erected by the citizens of a large city, as it seemed to us that more effect on the monumental art of the time could be effected through several praiseworthy monuments set up in different parts of the country than by the admiration which a single national monument would excite, however grand it might be.

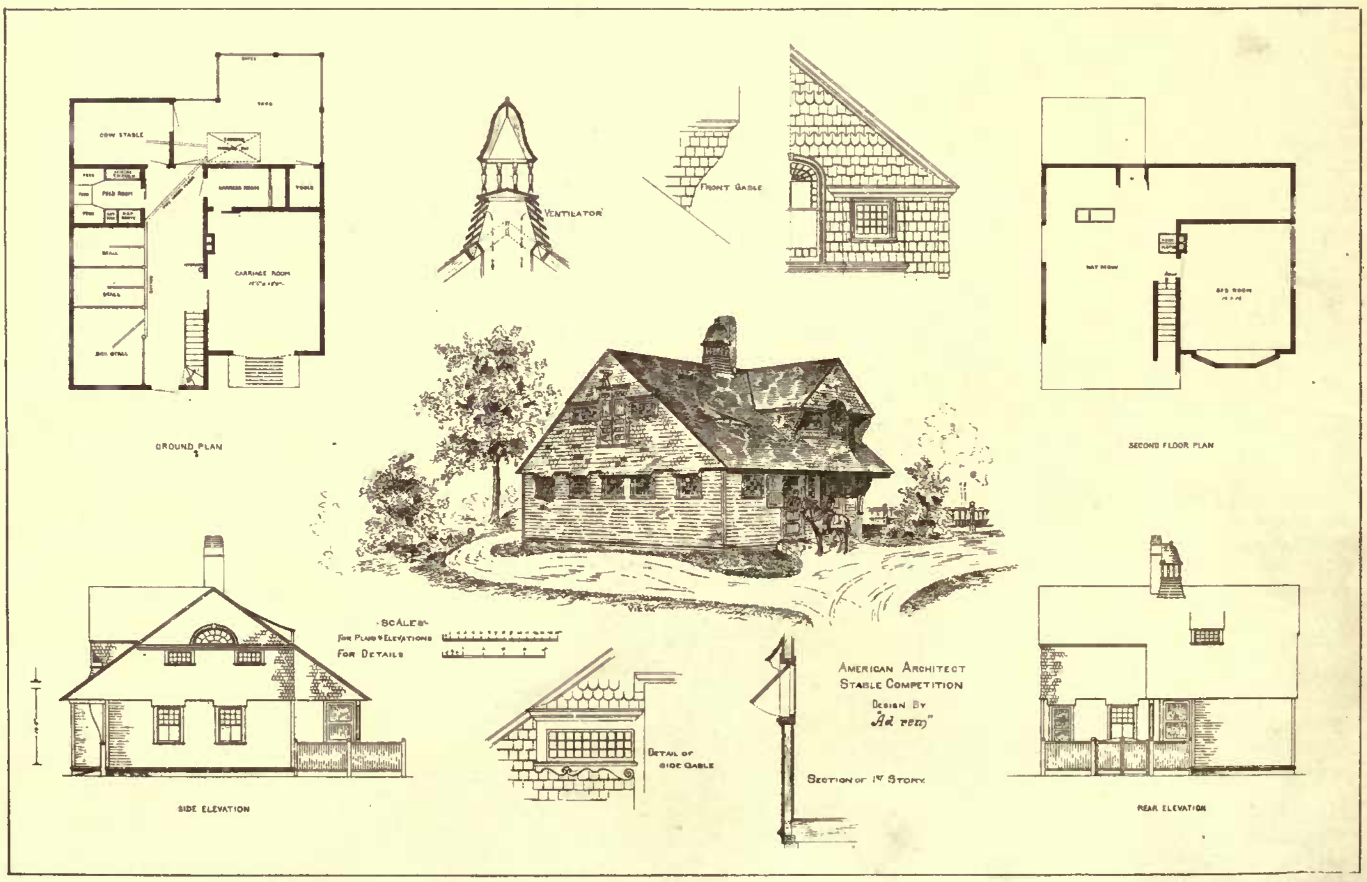
It does not seem as if it should be necessary to offer any prizes for such designs, which might well be offered gratuitously by their authors as a tribute to the dead, an offering to the art of the country, a token to the thoughtless that the designing of such structures demands for its satisfactory fulfilment the training of those years of study and observation which the practical man of the day scoffs at as wasted time.

Still, as prizes are customary, we offer three equal prizes of $50.00 each to the best three designs. We name three prizes on the supposition that three classes of design will be submitted, the essentially architectural, the essentially sculptural, and the third, where the attributes of architecture and sculpture are combined without either greatly preponderating over the other.

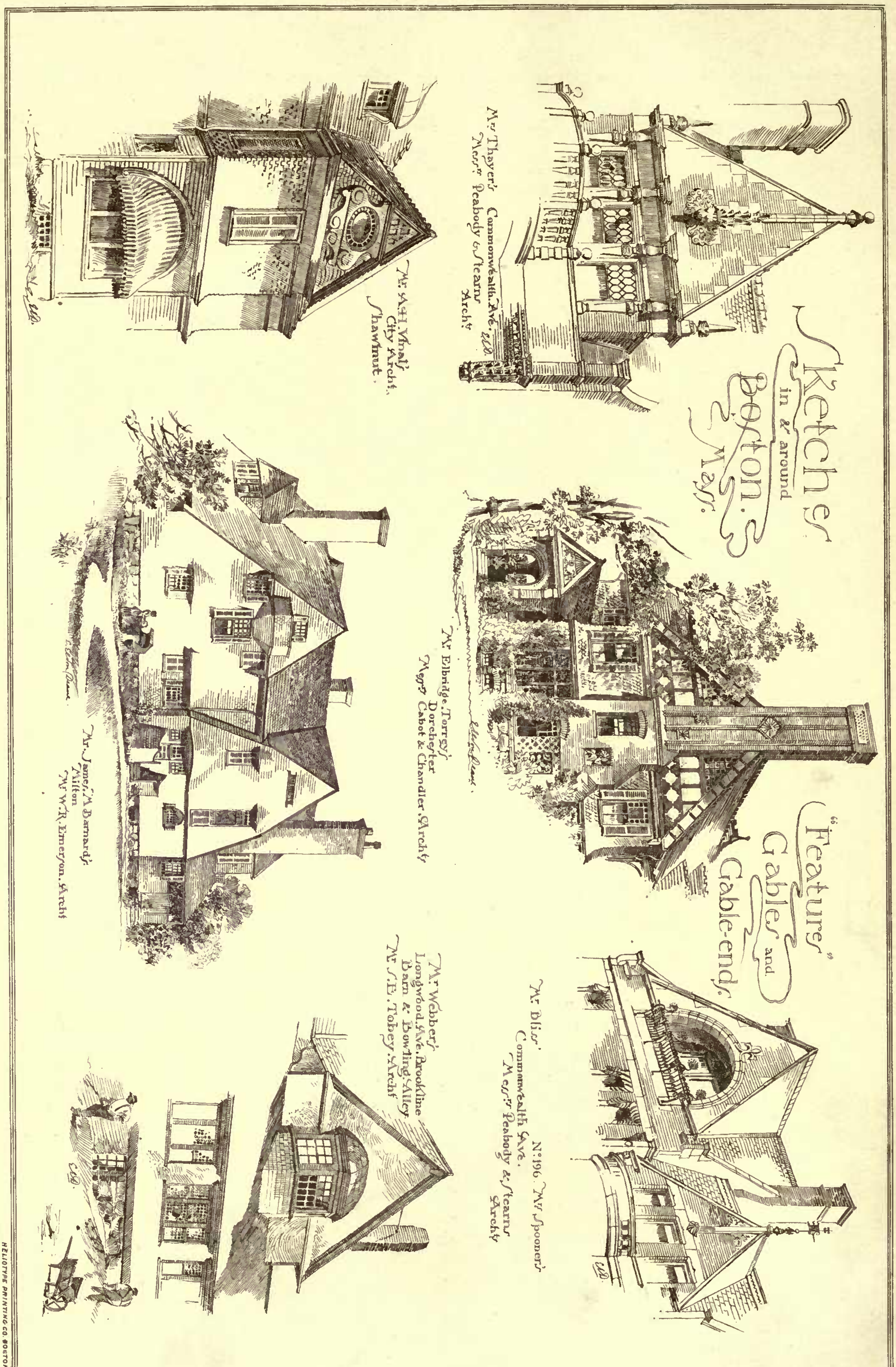
In order that no one, the busiest, the idlest, the most indifferent, or he who "never goes into a competition," might find excuse for withholding his offering in the stringency of the conditions, we suggested only "preliminary sketches," and we intend that each one shall construe the phrase according to his fancy.

The only requirements are: A design for a memorial to General Grant to be erected by a large town.

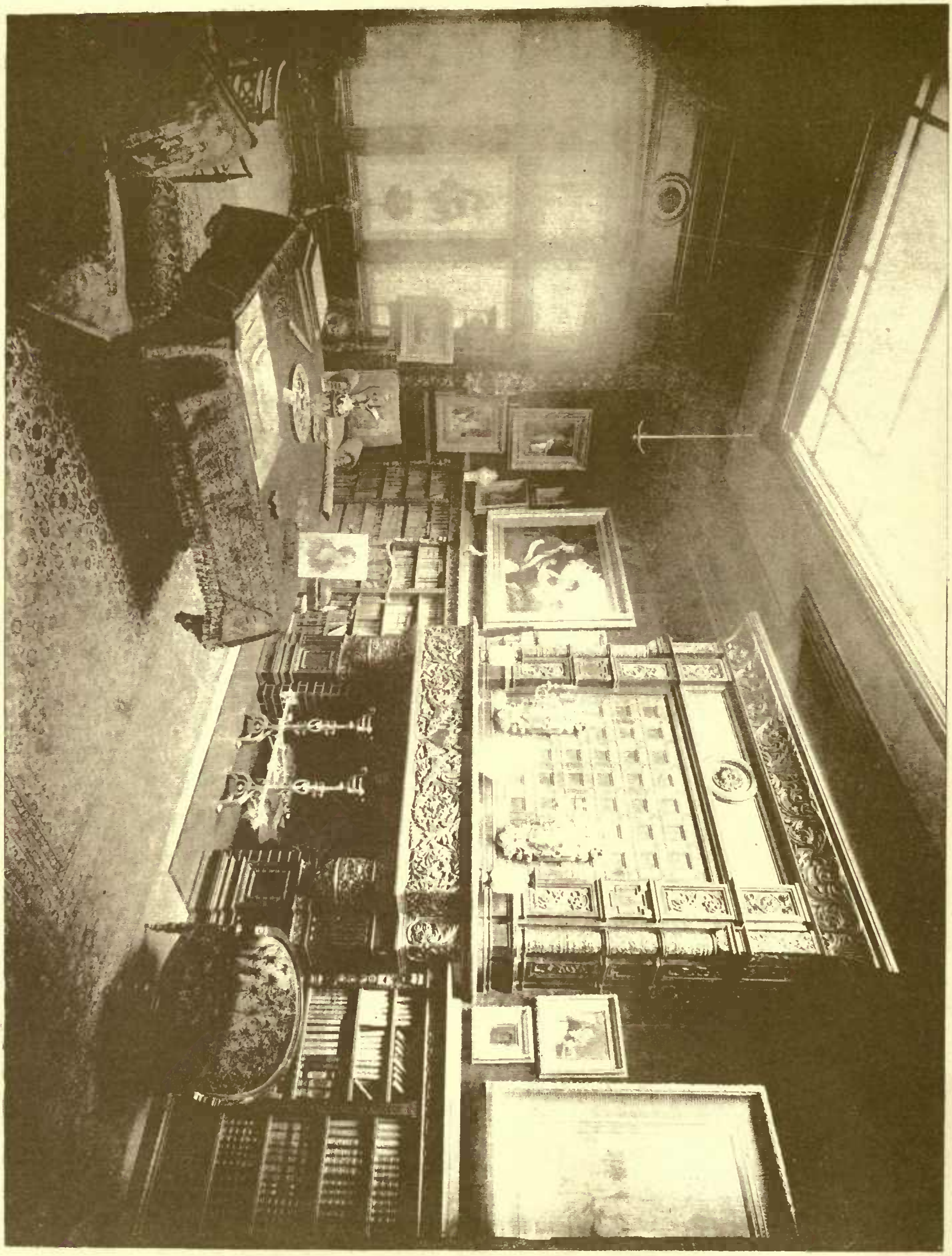




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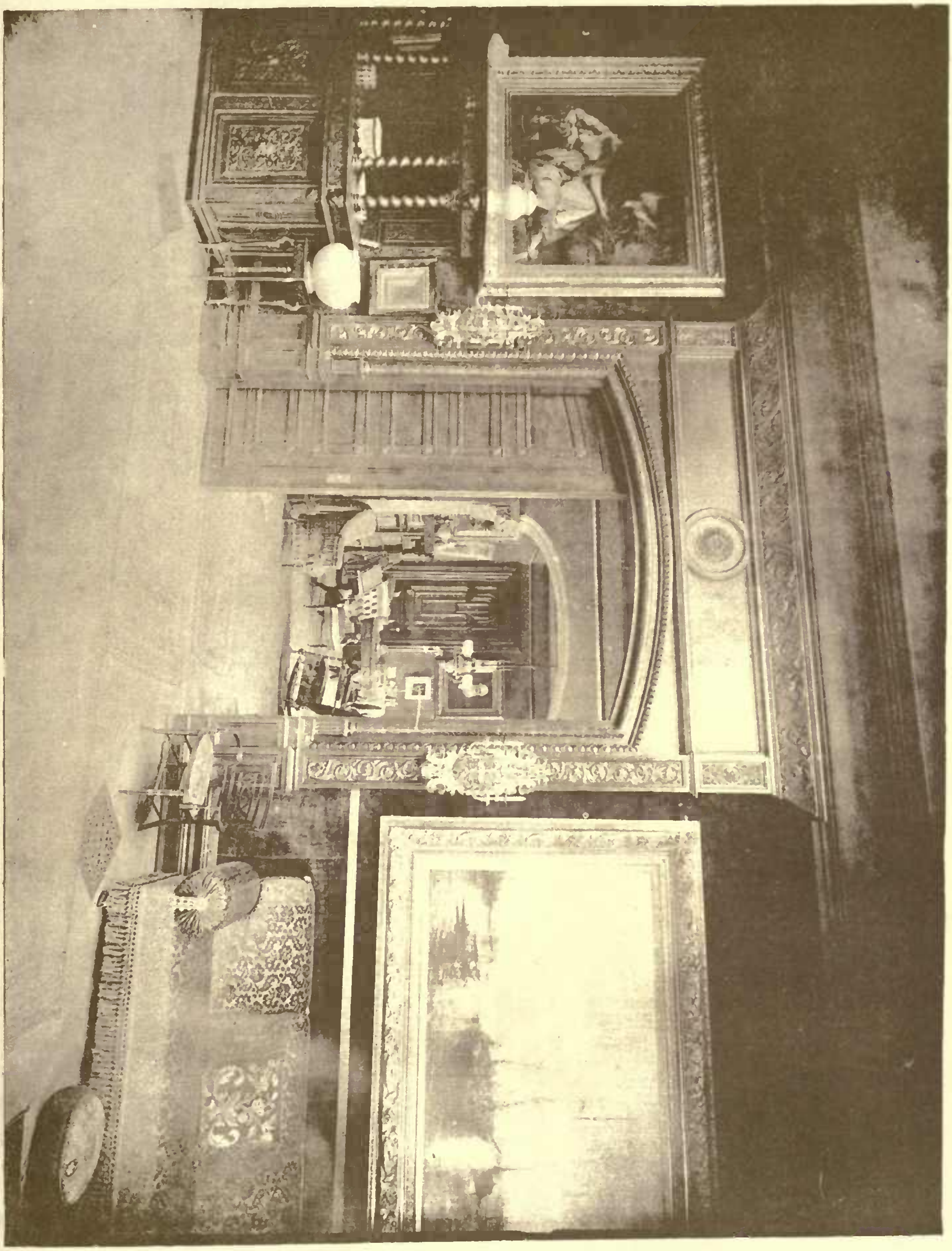


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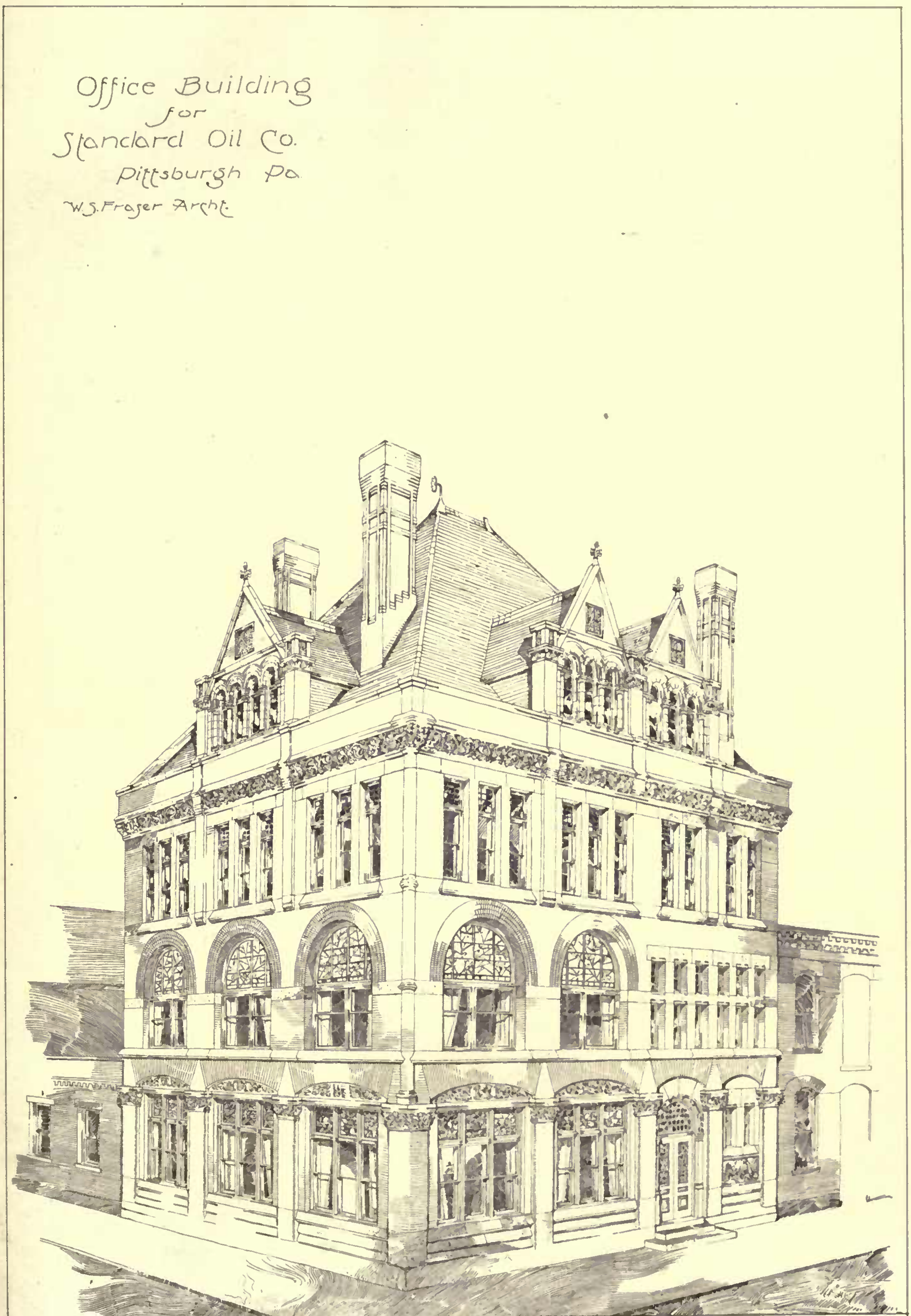
Library of George C. Leighton Esq.r, St. Louis, Mo. – Henry G. Isaacs, Arch't.

American Architect and Building News, Aug. 8 1885 No. 502

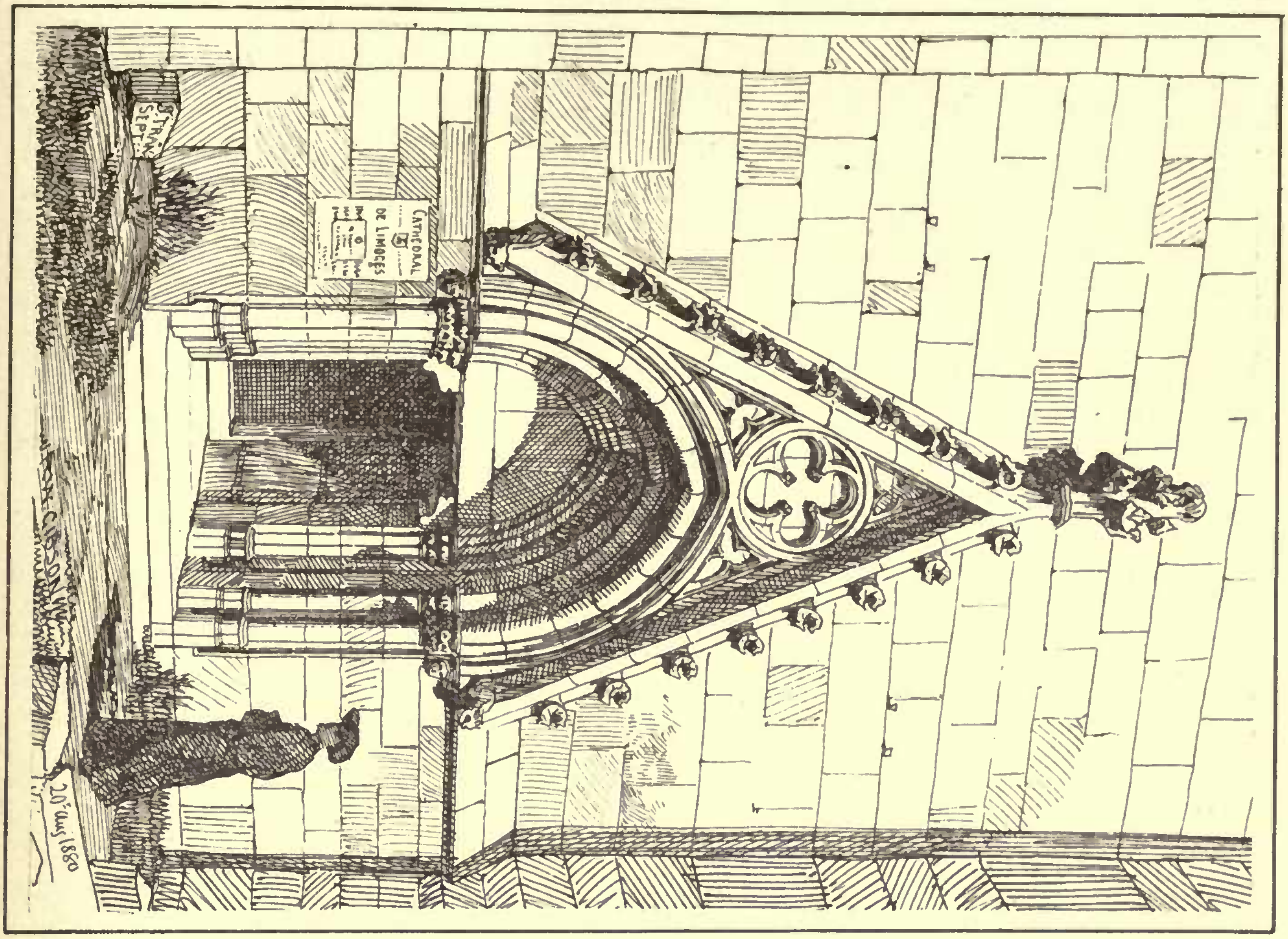


Library of George E. Leighton Esq. St Louis, Mo. — Henry G. Isaacs Archt.

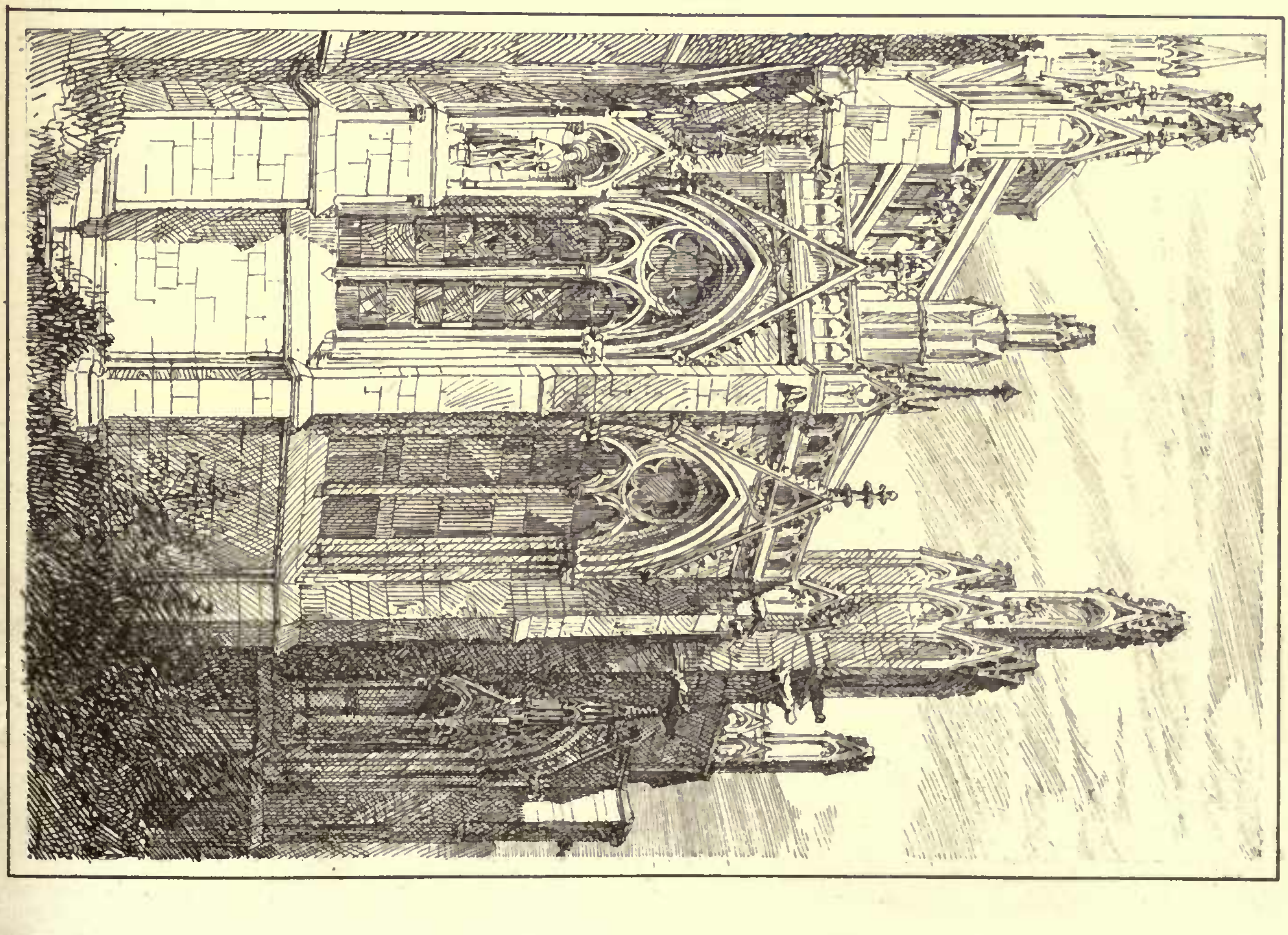
American Architect and Building News, Aug. 8 1885 No. 502



HELIOTYPE PRINTING CO BOSTON



Cathedral: Limoges:
Door to Sa Transept.



Cathedral Bordeaux. Part of East End.

The cost not to exceed $100,000.

The drawings in pen or pencil — no brushwork or color — to be of such size or at such scale as suits the convenience of the designer; but the scale must be graphically indicated on the drawing.

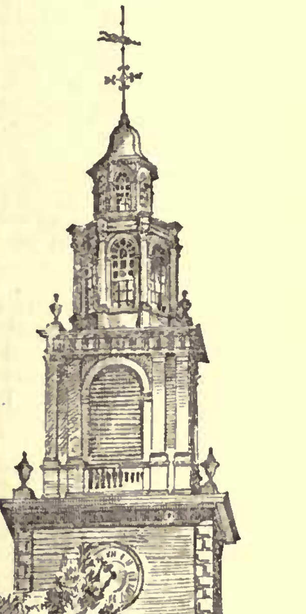
A brief memorandum of material and probable cost must be placed *on the drawing itself.* Each design must be represented by a perspective (or elevation) with plan and, if necessary, section at a less scale.

Each design must be signed with a motto and the author's name forwarded under seal at the same time. In case of publication the author's name will be announced — unless request is made to the contrary.

The award will be made by a jury of architects and sculptors.

Drawings must be received at the office of the *American Architect* on or before Saturday, September 19, next.

FORTUNE IN ARCHITECTURE.



ABOUT this time of year there is always in England a sort of glorification of youth and strength. From the competition for places in a school up to an inter-university shooting match we see efforts to bring forward the fittest. It is not merely a struggle of individuals, but of systems, and when there are so many concerned in the victories we are not to be surprised at the general prevalence of the belief that the trials of today are an augury of what is to happen. People have a kind of satisfaction when they learn that a new judge or bishop did good service in a cricket or rowing match. Some fruits ripen slowly, but they are exceptions, and we wish our prominent characters in Parliament and the professions to have held corresponding positions in school and college. The story is well known of the readiness with which Macaulay in the Athenæum Club seized an opportunity of narrating the histories of all the senior wranglers from the beginning of the century. It was a feat of memory, but it was also evidence that the young men who gained that position did not exhaust themselves by their exertions, and drop into obscurity. Early success is an indication very often of power that will endure for life.

We are often surprised that when careers are sought for the young folks who are supposed to possess such marvellous capacities, the profession of architecture is not more often selected. It may not be the most honored or the most profitable, but undoubtedly it is the profession beyond all others in which success awaits the young practitioner. It was an old saying that fortune favors the bold, but in architecture bold and young are synonymous. If we look for illustration to the Royal Academy, it will be found that all the architect academicians had won a high position in their profession at a much earlier age than any of the painter academicians, with the exception of Sir J. E. Millais.

It is hardly wise in considering a subject of this kind to allude to living artists, and, if we mentioned their names, it was only to show that our assertion is no less applicable at the present time, and can be tested in Burlington House. Let us take, therefore, the biographies of four of the most eminent among modern English architects, men whose memories still, and we hope may long survive among us. It will be evident that we are about to write of George Edmund Street, William Burges, Sir Gilbert Scott and Sir Digby Wyatt. It will be found that the four attained prominence either before they reached early manhood, or soon afterwards. Mr. Street was an improver in Scott's office when he was twenty. His share in the preparation of the competition drawings for the Hamburg Church brought him to the fore in Spring Gardens. Three or four years afterwards we find him established in practice on his own account, and in his twenty-fourth year he was an exhibitor at the Academy. Before he was thirty he was a man of mark in the Ecclesiological Society, and that position was gained by his works as much as by his essays and speeches. Mr. Street was not only a genius, but his whole heart was in his work, and he sought no other relaxation. Any man with so much energy must push his way to eminence. In his case, it would perhaps be more true to say burn his way, for he seemed on fire with energy.

Scott was of a less intense disposition, and he was not so fortunate in being placed early on the right track for success. His experience in a city office was enough to make a youth with artistic sentiment rather disgusted with architecture, and when he opened a small office in Carlton Chambers, the work that came to him was, he acknowledged, more mean than that of his days of pupilage. His father died. It was necessary that he should forthwith obtain commissions of some kind, and a few for workhouses appeared to be nearest his reach. Scott made a personal canvass of every guardian, and succeeded in being appointed architect for four unions. He regarded the profession as no more than a laborious means of making a livelihood, and was content when he secured an humble class of work. His churches came under that class. Chance threw an article by Pugin in his way, and, after reading it, as he said himself, modernism passed away from his mind, and all his aspirations became mediæval. Scott was twenty-nine or thirty before this transformation was accomplished, and therefore he may be said to have started rather late in the race. But the new spirit enabled him to overcome opposition, and when he was thirty-three the Hamburg competition brought him a prestige which was sufficient to gain him estimation from the clergy. Scott's case is therefore peculiar. His ambition at first was to secure commonplace work, and in that he succeeded while he was a very young man. But as soon as something more worthy was presented to his mind, he was no less fortunate in attaining it within a few years after he had made the effort. He may accordingly be cited as an example to show that when Fortune has resolved to be kind to an architect, she is expeditious in bestowing her favors.

William Burges can hardly be taken as a type of the successful architect in the common acceptation of the word, for if commissions were proportioned to his genius he must have been the busiest architect of his time. His notion of what was meant by education for practice was very different from Scott's or Street's, and before he opened an office he had gone through a long *Wanderjahr* and measured much of the best mediæval work on the Continent. But the remarkable fact is that in his first competition, *i. e.*, the Lille Cathedral, Burges, with all Europe against him, was successful, and in a year or so afterwards he gained the prize at Constantinople. It was quickly followed by the commission for the Cork Cathedral, and then if failures in competitions might be considered tests Fortune appeared to have deserted him. His works at Cardiff and Studley Royal need not be taken into account, for as they were to be unique in character, they must have been entrusted to him. In his case we see the promise of a great success given rather early, and if a longer life had been granted to him that promise was likely to have been realized beyond his expectations. He was justified by his early experience in waiting patiently for a return of his good luck.

In many ways there was a resemblance between Sir Digby Wyatt and Burges: both never ceased to be students, and the gaining of money was not the first consideration with either of them. It is remarkable that although Wyatt tempted people to think of him as an enthusiast for *bric-à-brac* rather than a practical architect, he gained a fair share of patronage, and, moreover, it came to him early. His duties in connection with exhibitions and Government offices absorbed much of his time, and it may have been supposed that he had no leisure to bestow on ordinary clients, still his list of executed works is satisfactory, although it does not correspond with his great ability.

If the practice of Sir Digby Wyatt is compared with that of his associate, Owen Jones, they may help to suggest the mystery which apparently is found in professional life. Jones's position as an architect deserved to be earlier recognized than Wyatt's. In 1851, when it was supposed that a new era was about to open making a new style indispensable, Owen Jones might seem to be the master of the situation, the man for the hour. Classic and Christian architecture he proclaimed were dead and gone. The new wants, the new materials, the new sentiments, the new science, could only be expressed in a style that had been derived from the Alhambra. The public admired the charming reproduction that was to be seen at Sydenham, but they were not convinced that stucco so arranged made better residences then when applied flatly as in their houses. One of the cleverest men of the age was, therefore, compelled to live in the expectation that geometric principles must prevail at last, and meanwhile had to gain a subsistence by designing playing-cards and other things of paper. The public were as far from believing in his constructive skill at the close of his career as at the beginning of it. Owen Jones's case is as representative as could be desired. He had spared no pains by study and travel to make himself a master in the profession; he had given proofs of original skill and of his readiness to abandon the beaten tracks; but the English people chose to esteem him as a producer of colored plates, a revlver of the old art of illumination, and, according to their wont, they adhered to that opinion. His discourses on "the present necessity of an architectural education on the part of the public" were the voice of one crying in the wilderness and unheeded.

There were architects who envied Wyatt and Jones when they thought of the possibilities of big commissions to which every *attaché* of the new Art Department might aspire. The lucky man was not, however, a civilian. For a time Captain Fowke appeared to carry everything before him, and, if he condescended to seek for work of an ecclesiastical and unofficial kind, it is not unreasonable to assume that he must have been no less omnipotent. But all his victories

were gained in the short term of ten years, and when he died this child of Fortune was forty-two. How many among us have failed to attract one good commission from the blind goddess at that age?

If we go back from our own times to one that is earlier a like phenomenon is before us. Take Sir Charles Barry, for example. He was among those who believed in the advantages of foreign travel, and did not seek for practice until he was twenty-seven. But then the prizes came quickly to him, and in little over a dozen years he possessed the greatest that ever fell to an architect in this country. Pugin, who was permitted to share in that prize, was another example of early success. In our matter-of-fact days it hardly seems possible that so many events on sea and land could be crowded into forty years. But even more remarkable is the story of Harvey Lonsdale Elmes, who in his twenty-third year was selected to be the architect of St. George's Hall. That it was no transient gleam of prosperity is seen by the number of the commissions which were offered to him during his brief existence.

It would possibly become wearisome if we followed the history of fortunate architects much farther. We may say, however, that what is seen to-day is but a repetition of what happened a century ago, and even earlier. The men who have a claim to be called successful will be found almost invariably to have undergone few tests of their patience, and it might almost be laid down as a law that, unless an architect finds commissions are coming easily to him before he is forty, he may abandon all hope of wealth or eminence. Few men have had a more toilsome uphill route than Sir John Soane, the bricklayer's son, and whose very name was borrowed; but at that age he was possessed of his Governmental and bank appointments, and the remainder of his way was easy.

It is a common expedient in fiction to show the triumph of the old over the young. Everyone who reads novels or has seen many plays can recall scenes of that kind. In one the old broken-down jockey jumps on a horse and wins the race from all conspirators; in another the old cudgel-player ascends the platform, and by skill and dexterity breaks the head of the giant; in a third the old prompter or supernumerary puts on the garb of Romeo and insures the success of the Juliet of the night; in a fourth a venerable gentleman passes his rapier through the body of the notorious duellist, who had just slain his son and grandson. Scenes of the kind may not be found in the works of the great masters, and Shakespeare, although friendly towards old age, has nothing of the kind. Othello felt there was some excuse for wronging him because he was "declined into the vale of years," and the "first old men" in the great dramas, although they may show great vigor occasionally, do not carry everything before them.

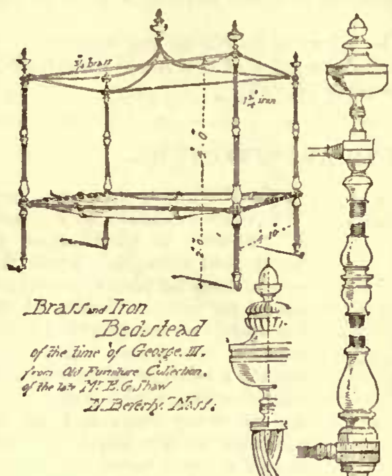
The experience of architectural practice is more corroborative of the Shakespearian than of the modern fictionist's practice. In all the competitions which have disturbed the world of late years, how many instances can be cited in which the prize was borne off by the seniors of the profession? There was one somewhere in Scotland; but, as well as we recollect, nearly all the competitors were first put out of court for non-compliance with the conditions. Judging by the history of competitions, it may be assumed that the prize-winner will be among the younger men.

It might be supposed that, with work like architecture, much experience is necessary, which is only to be acquired by the toil of many years. But the length of time has not been defined, and as long as men have been building they have not been afraid to entrust the responsibility for the works to the hands of youth. England is not alone in that respect. The practice is so ancient that the world has come to act upon it almost instinctively. An architect who is advancing towards middle age is expected to refer to many buildings of his own, and, should he be unable, his incompetency is not ascribed to fortune. In no profession is the maxim of nothing succeeding so well as success, more applicable than in architecture.

It will be asked what is the conclusion that is to be drawn from all this? The reply, we fear, must be considered harsh and painful. Believing in the doctrine that history is but philosophy in practice, and that its use is to afford us examples, we maintain that every architect, if he will only be guided by the past, can give a good guess as to his chance of future success. A time must be allowed for training, and for making one's name known. But before he reaches thirty a man who expects to be prosperous should have convincing testimony that his circle of clients is gradually increasing. If he has not had dealings with builders on his own account by that time, it will be well to forbear raising Châteaux en Espagne. The ten years that follow offer a crucial test. It is possible to hear of men who have had a good practice and lost it before they were forty, but, unless we are mistaken, it would be difficult to bring forward cases in which prosperity dates from that age. Chances are always turning up to surprise the world, but there are fewer of them in architecture than in the sister profession.

The effect of thoughts like those we suggest is likely to make people desponding. An architect who has a little of the stoic will be able to bear his lot amidst greater discouragements, and we know of many who continue to find a pleasure in the study of the art, although they are no longer sanguine that it will bring them any other reward. There are others who believe that the profession affords them opportunity for duty, and are satisfied. Besides, it is possible to lower one's expectations, and the student who expected nothing less than to be a Royal Academician may eventually be happy and contented when he finds that after years of canvassing he has succeeded in gaining one of the least profitable district surveyorships. Too many, however, continue to indulge in visions of artistic success, when, on reflection, they would see how illusory is the contingency. It has been said that "where no hope is, life's a warning, that only serves to make us grieve," but the question that should be asked by a great many is whether that hope might not be found with more confidence in some other pursuit?—*The Architect.*

ECONOMICAL AND FIRE-PROOF PLASTERING.


Brass and Iron Bedstead of the time of George III. from Old Furniture Collection of the late Mr. E. G. Shaw N. Beverly, Mass.

To quote from "*Notes on Building Construction,*"—"Plastering consists of applying different compositions, resembling mortar, to walls and ceilings in thin layers, so as to form smooth surfaces for the sake of appearance and cleanliness." This would be rather too brief a description with which to sum up the plasterer's trade, but it is sufficient for our purpose, and may stand as a preface to the paper we are writing; not so much with the object of describing the different materials and process of plastering now in use as to introduce to architects, builders, plasterers and others interested in building operations a new material, "Robinson's cement," recently invented, patented, and brought upon the market by Messrs. Joseph Robinson & Co., of the Knothill Cement and Plaster Works, near Carlisle, Eng. This cement will, we feel sure, be a welcome addition, not only to the plasterer, but to his employers. It is so good, so true and uniform in its manufacture, so economical and efficient in its working, and may be used for such a variety of purposes, that we believe it only requires to be sufficiently known to come into very general operation. We are convinced, after a long series of experiments and tests, of its great utility and efficiency as a substitute for any of the cements now in use, and from its cheapness, it is likely, when known, to very generally take the place of the present mode of plastering, entirely altering for the better the character of the work about our buildings in this very important respect.

So many improvements have been made in building materials and appliances of recent years, the artistic knowledge and requirements of the present time have so much increased on the part of architects, builders and their clients, that to be contented any longer with the plastering as it is at present done in the general way is hardly possible. It is not only tedious and clumsy in its preparation and application, but often imperfect in its result. The plasterer's pit taking up so much room about a building, and for such a length of time, for the proper slaking of the lime, is a positive nuisance, and a change in this direction is not only desirable but requisite, particularly where, as in towns, the space around building operations is limited, and in these days of rapid progress expedition in carrying out the works is so essential. These considerations, amongst others, have led Messrs. Robinson & Co. (or rather the head of the firm) to devote much time and attention to the invention of a cement that should obviate all this, by being equal in all respects to the Keene's, Parian, or other cements now used (but in limited quantities, and in the best class of work only, to which they are confined by reason of their cost), and at the same time so much cheaper that it might be introduced and used not only as they are, but as a substitute for the ordinary plastering, consisting of lime, sand and hair that we have hitherto been compelled to put up with. This result they now claim to have obtained by means of their new invention, and they reasonably hope that their cement may be given a fair trial, feeling assured that it will give every satisfaction, either when used in lieu of Keene's or Parian, or as a substitute for ordinary plastering.

Before more fully describing "Robinson's cement," it may be as well briefly to glance at the ordinary methods of plastering in general use, as it will enable us to make comparisons that may assist us in arriving at a fair decision upon this new material. In the ordinary methods of plastering familiar to most of us, the materials used are lime, hair and sand mixed together, and laid on in successive coats differing from one another in their preparation in accordance with the character of the work. Pure, or fat limes, are generally used for the sake of economy and safety, hydraulic limes requiring especial attention to prevent them from blowing. The lime should be most thoroughly slaked, or it will throw out blisters after being spread; for this reason the "stuff" is made long before it is required, and left for weeks to cool, *i.e.*, to become thoroughly slaked. The different preparations made in this way are the "coarse stuff," "fine stuff," and "plasterer's putty." "Coarse stuff" consists of one or one-and-a-half parts of sand to one of slaked lime; the sand is heaped

round in a circle, and the lime, previously mixed with water to a creamy consistency, is poured into the middle, hair is then added and well worked in to make the coarse stuff hang together, and the mixture is left several weeks to cool. "Fine stuff" is pure lime slaked to a paste with a small quantity of water, afterwards more water is added till it is of the consistence of cream, it is then allowed to settle and the water run off, that in the mass allowed to evaporate until the whole has become thick enough for use. "Plasterer's putty" is similar to "fine stuff" only prepared more carefully and run through a sieve. Taking the ordinary three-coat work, usually specified as "plaster, float and set," as an example. The first coat or "pricking-up" for ceilings or partitions consists of a layer of the "coarse stuff" spread over the laths, stiff enough to hold together, but sufficiently soft to pass between the laths and form a key; it is then scored over with the points of laths to form a key for the second coat or floating, which is applied when the pricking-up is sufficiently dry, and consists of "fine stuff" with the addition of a little hair, and is laid on with floats, worked upon screeds of plaster to ensure the surface being true; this is then gone over with a hand-float, any defects made good, and allowed to become perfectly dry. Then comes the third or setting coat. If the surface is to be papered it should be set with "fine stuff," and if whitened, with "putty" and washed, and if painted it should be finished "trowelled stucco," composed of two-thirds "fine stuff" without hair and one-third fine clean sand. If it is required to set very quickly, especially in damp weather, one-sixth to one-third plaster-of-Paris is added to the "stuff," and is then termed "gauged work;" it can only be mixed in small quantities, and great care must be observed that the other coats are perfectly dry, or the shrinkage being unequal, the last coat will be full of cracks.

Rendering is the term when the plastering is applied to walls; it is done in the same way as before described, but not so much hair is required in the "coarse stuff" as when used on laths. With the results, as thus worked out, we are all pretty well acquainted, but are not all equally satisfied. It has hitherto, for the want of a better, and not much more costly, material, been considered sufficiently good in the ordinary way to meet our requirements; but how often have we found by pricking the surface that the under coats run out like dust, indicating their soft and unsound quality. Then the blistering that often takes place over the surface, although so much time and care has been spent in the endeavor to slake every particle of lime, and again there is the cracked surface too often seen, rendering it necessary to apply some other material, such as paper to hide its defects. We submit that this is no longer sufficiently good, when the other fittings and finishings of our dwellings are so much improved in design, material and workmanship, if the desired end can be obtained at a trifling additional cost over ordinary plastering, as we believe it may be by using "Robinson's cement." This can be applied as Keene's or Parian now are, giving equally good, if not even better, results, and by reason of its cheapness may be substituted for general plastering, making good work in this respect the rule, instead of the exception, as at present. The additional cost in the material itself we think likely to be pretty well counterbalanced by the saving in space, time, and labor in working "Robinson's cement."

The plasterers' pit, and the time occupied in slaking the lime and waiting for the drying of one coat before another can be applied, will be no longer required, the carrying of the "stuff" from where it is prepared to the spot where it is wanted would be obviated, the cement being mixed where used with the requisite quantity of sand applied at once in one coat, and finished off as desired there and then, forming one homogeneous body, without any delay arising from the dampness of the weather or any other cause. Messrs. Joseph Robinson & Co., the patentees and manufacturers of this new cement, have been established since the year 1828. Their principal plaster and cement works are situated at Knothill, near Carlisle, where they have immense deposits of the purest alabaster. They have also extensive quarries in Westmoreland and in Staffordshire. Their Knothill works are directly connected with the Midland Railway system, the Midland Company having built the Cotehill Station specially for their extensive traffic and laid down sidings in connection with the works. The quarries situated in Inglewood Forest, from which they obtain their best alabaster, are practically inexhaustible, and are in first-rate working order. The uncovering, though considerable, requires no mining, the average depth of the face of the alabaster when uncovered being from twenty to thirty feet. Very large quantities of the alabaster are now bared, ready for use, the principle here being to keep well ahead in this respect in case of any unusual demand. The alabaster in these quarries in its original state is almost pure white, and as compared with alabaster generally, it is peculiarly hard, which is a great point in its favor, for the harder the nature of the raw material, the better the quality of the cement and its strength in setting after manufacture. Coal is cheap in the neighborhood, and the direct communication with the Midland Railway simplifies the getting it and sending away of manufactured articles. Messrs. Robinson & Co. make their plasters and cements where the raw material is produced, thus reducing their working expenses to a minimum, and enabling them to compete favorably with any other manufacturers, equally well placed. Hitherto for many years they have confined their attention principally to the manufacture of plaster-of-Paris, in its various forms; but having now perfected a cement so likely to come into extensive use, they are making every preparation needful to insure their meeting a large demand by erecting the additional necessary machinery. The manufacture of this new cement is simple, uniform and expeditious in the extreme, compared with that of other cements of similar character, which are not only complicated, but so slow and tedious that a long time is required in their manufacture. As an example of the expedition with which "Robinson's" can be manufactured, we may mention, that by way of a trial they have on receiving an order by the morning's post taken the alabaster out of the quarries, converted it into cement, and sent it off by rail the same afternoon. This means, of course, a great saving in the cost of manufacture, and enables them to offer their cement at a price which, together with its very greatly increased power of carrying sand, makes it possible of introduction for general plastering work. In perfecting this cement many experiments have been tried, and the results very carefully tested. These tests have been in operation over several of the winter months, and are most satisfactory. A short description of some of these tests may be useful.

TESTS.

A bay of a brick wall, a yard wide by two yards high, was covered with the ordinary three coats "render, float, and set" work for the sake of comparison; next to this and subject to exactly the same influences, and in similar sized pieces, were some five or six slabs of "Robinson's" cement work done by an ordinary plasterer as follows: —

1. The rendering coat, averaging five-eighths of an inch thick, consisted of two parts sand to one of cement, set directly sufficiently hard to be finished with a rough surface of equal parts of sand and cement, and in the space of a few hours was particularly hard and strong, equal in this respect to Portland.

2. The second slab was in the proportion of three parts of sand to one of cement for the rendering coat, of the same thickness as before, and was finished directly with pure cement one-eighth of an inch thick. This in a few hours also set very hard, and its strength became very considerable.

3. The third slab had four parts of sand to one of cement for the rendering five-eighths of an inch thick, and finished with pure cement. This also set very hard and strong, worked easily, and stands admirably.

After an interval of several months there is no sign whatever of deterioration in any of these examples; but, on the contrary, they have hardened with time, which is a conclusive proof of the quality and strength of this cement.

4. Several other mixtures of the sand and cement were tried at the same time for rendering coats, five to one and even six to one. With this very large proportion of sand the result was considerably stronger than the ordinary rendering of lime, sand and hair; but for general work the proportion of "four of sand to one of cement is recommended." The quantity of sand this cement will carry is greatly in excess of other similar cements, and proves its natural strength and economy in use.

On laths for ceilings or partitions it was tried in the first instance pure, averaging three-quarters of an inch thick; including the key. There was very little waste on putting it up; it formed a good key to the laths, and in the space of a few hours set so strong that it became extremely difficult to break it away even with hard hammering.

5. It was next tried for similar work with two parts of sand to one of cement, with a very little hair added for the first or pricking-up coat, and then finished with pure cement one-eighth of an inch thick; this made excellent work, and in pricking-up there was little or no waste.

Its resistance to fire was also tried in several different ways. It stood the tests applied, and proved its excellent fire-proof qualities; for casing wood and iron work it will be found very valuable, and also for forming a fire-proof ceiling. For running cornices, skirtings, mouldings, angle beads, etc., it is particularly well adapted, and is very good and strong, the labor in working all these being similar, but somewhat less, than in other cements. The cement was also experimented upon for external work. A piece of outside wall was selected in a most exposed position, and rendered with two parts of sand to one of cement finished with two of cement to one of sand, the sand being worked up to form a rough surface. This was done in January last, and has had all kinds of weather upon it since. After five months there is no sign of any deterioration whatever; indeed, its exposure has hardened it, proving that it might be used for outside work, especially in timber framing. As an additional proof of the strength of this cement, compared with other cements, an inch square briquette, seven days old, bore a strain equal to three hundred and seventy pounds before breaking, and as three hundred and fifty pounds is considered a very good and sufficient test for a Portland cement briquette of the same size and age, this is highly satisfactory.

Its tensile strength being so considerable makes it very valuable for setting decorative tiles, glazed bricks or "gauged" brickwork, where putty is now used; and there is no fear of its salting or expanding. It has already been used with the most perfect results in one of the large public buildings in London, and is considered so satisfactory that the architects are about to use it on a much larger scale elsewhere. It has been carefully tested for painting in several ways by a well-known London decorator, and with entirely satisfactory results, showing that it can be applied and painted upon at once, as with Keene's or Parian, or it may be left to get dry, and

then painted, as within three weeks of being rendered it is thoroughly dry and ready for decoration, and will stand fine colors perfectly. With other cements, if left, the period that must elapse before they can be painted must be measured by months instead of weeks. In using it no notice need be taken of "the time of year or the state of the weather;" the plasterers can be put into a room with the requisite quantity of sand, and cement and work it straight away; there is no delay required for drying, for as fast as one coat is done, the finishing coat can be run and the whole completed. The treatment of the various cements at present in use varies very slightly; they are generally laid on in one thickness of from half to three-quarters of an inch, and of the proportion of one of cement to one or one-and-a-half of sand, the surface being finished with a thin coating of neat cement. The ground-work is often done in Portland finished with Parian or Keene's; this, however, is rather doubtful policy, for besides bringing an additional material on to the works, it often (unless the Portland cement is most thoroughly dry, which of course takes time), sets up a chemical action detrimental to the finished face. Portland need never be resorted to with "Robinson's," which is sufficiently strong to carry easily four parts of sand and one of cement, making excellent work with that large quantity of sand, and being very economical in use on that account. Like some other cements, it can be brought up to a beautiful polished surface if required.

Hitherto cements of this description have been used for plastering in first-class work only, their cost being against their general adoption, and we have had to be content with the ordinary style of plastering for large surfaces. However, we now hope to arrive at a better state of things, rendered possible by the introduction of "Robinson's cement," which, whilst comparing in every way equally with any of the others, can be manufactured and procured at so much less cost, bringing it within the reach of all, for general as well as special purposes. Plasterers who have used it report very favorably upon it, and that it works easily, very smoothly and well; it does not discolor their tools, nor has it any other objectionable qualities. As its simplicity and cleanliness in working cannot be too strongly insisted upon, and its strength and durability are proved beyond a doubt, we are convinced that it only requires to be tried to establish its own claim to the consideration of architects, builders, plasterers and their clients. It is needless here to specify all its uses. For private dwellings, public buildings, hospitals, schools, workhouses and infirmaries it is especially well adapted, as its antiseptic qualities are a great advantage and make it practically impervious to absorption and infection. It possesses the additional advantage of being as easily and thoroughly washed as an ordinary slab of marble. It has been already brought under the notice of several architects, who have expressed their entire satisfaction with it, and are adopting it because of its high quality, economy in use, and the satisfactory results obtained.— *G. H. Hunt, in the Building News.*

A REMINDER OF BUTLER'S RULE IN NEW ORLEANS.

New Orleans, La., July 20, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Referring to the above-named item in your number of July 18, I may venture the suggestion that "the doughty patriot" (General Butler) will scarcely care to take the whole credit for the inscription on the base of the Clay statue, which, instead of being *carved* in the *solid granite,* where dissatisfied citizens would have had *to dig it out,* was simply stencilled in black ink, in ten lines, six of which begin with words cut off just when the stencil reached the side of the panel, so that a fine sentiment is made ludicrous by this schoolboy bungling, and it is quite a satisfaction to see the ink quietly washing away. J. F.

WARM WALLS.

Winnipeg, Manitoba, Can., July 20, 1885.

To the Editors of the American Architect: —

Dear Sirs, — You will greatly oblige a subscriber to your very practical and valuable journal by a reply to the following query: What is the cheapest mode of making a wooden terrace warm? I thought of lime and sawdust between studs. Perhaps some one can suggest a better preventative of cold, less liable to become the harbor of insects. We have an outside temperature of forty degrees below zero to contend with. Yours truly,

W. T. Dalton, Architect.

[The best way of keeping a wooden house warm is by back-plastering and paper. Two layers of good felt or cane-fibre paper over the outside boarding, and shingles — not clapboards over that, with a continuous sheet of back-plastering on laths between the studs, either nailed to fillets on the sides of the studs or put on other laths which are nailed directly to the inside of the outside boarding, will, with good interior plastering, brought down to the floor everywhere, give as warm an outside wall as can be obtained even with brick filling, and a warmer one than is likely to be got with a filling of sawdust or any other material which settles by its own weight. In back-plastering, care should be taken to get a good key to the mortar, and to bring it well up on the studs, sills, girts and plates, so that no crevices shall be left anywhere, and instead of leaving it off altogether at the floors, as builders often do, particular pains should be taken to make the spaces about the ends of the beams absolutely tight. Some architects, in addition to the back-plastering between the studs, make the inner plastering coat double, by nailing fillets over the first plastering, and then lathing and plastering again; but if the back-plastering between the studs is thoroughly done, the double inside plastering is seldom necessary, and if it is not well done, the house will be cold in spite of the double inner coat. In the way of minor precautions, care should be taken to close every crevice in the exterior skin of the building, through which a breath of the intensely cold winter winds can penetrate, to circulate thence over the house. Even with well-protected walls, there are usually vulnerable places around the window-frames, particularly under the stools, and these should always be ploughed on the under side, so that the shingles can be driven up into them to break the joint, and in addition to this it is well to tuck cotton from the inside into the open space just under the stool, as well as into other suspicious crevices. If either tarred or ordinary paper is used to put on the boarding around the window and door frames, under the outside casings, enough wind is likely to get in there, especially after the shrinkage of the casings and studs has torn the paper, to cause a chilly draught in the rooms in the vicinity of the windows, and it is better to use strips of zinc under the casings.—Eds. American Architect.]

LOCUST PINS.

Lynchburg, Va., July 15, 1885.

To the Editors of the American Architect: —

Dear Sirs, —Please inform me of the price of locust pins, the various kinds and dimensions, and where to be delivered, as well as whether the purchaser pays the freight or it is paid by the seller. Your attention to this will much oblige

Respectfully, J. B. Norville.

[Inquiry discovers that in this market only oak pins are used, which cost about a cent apiece. Locust has such good qualities, however, that they might be easily introduced.—Eds. American Architect.]

NOTES AND CLIPPINGS.

Cutting Glass by Electricity. — Electricity has now been applied to cutting glass tubes, an operation of some difficulty when the diameter is large; and iron wire half a millimeter in diameter is wound round the tube at the place required to be cut, and the ends are connected by means of copper conductors of the same diameter, with the poles of a powerful battery or other generator of electricity. This iron becomes heated when the current flows, and it is only necessary to cool it suddenly with a few drops of cold water in order to produce a clear cut. Glass tubes four inches in diameter are now cut in this way. — *Journal of the Society of Arts.*

Lifting a Masonry Arch. — *Les Annales des Travaux Publics* for July, 1885, describes the lifting to a more elevated position of a masonry arch, having a span 32.8 feet and a rise of 4.26 feet. The arch was fifteen feet wide, and at the key was 2.88 feet deep. A lining of plank was first put under the arch and then five centres made of wrought iron, apparently. Under each end of the arch were then placed two bents of timber, 5.8 feet apart, and well braced in both directions. Each of these bents rested on two longitudinal timbers and between these sticks, midway between the centres, were located double wedges, and between each set of wedges and directly under the centres and their posts were lifting screws. This arrangement having been carried out, the arch was cut at the springing lines with hammer and chisel, leaving, until all was ready, three points of support on each side. When the weight of the arch, which weighed 180 tons, was thrown entirely upon the centres several cracks made their appearance, and the crown sank about one and one-half inches. At the first turn of the screws, however, it was found that the cracks showed no signs of further increase, and the lifting was commenced with great uniformity. At each vertical inch of hoist the screws were stopped and the wedges tightly driven. The total distance raised was 1.4 feet, and this work was accomplished in fourteen hours. During the lifting a further sinking of about three-fourths of an inch took place, and the eight cracks extended from end to end of the arch. These cracks had a width of three-eighths of an inch, but they were lost in the interior of the masonry without appearing on the extrados. These fissures were filled with a thin grout of one part Portland cement to one part of sand, and eight days were allowed for the setting of this cement before the centres were removed. When the arch rested on its new abutments a fresh hair crack appeared, but without doing any further damage.

Substitutes for White Lead. — The attempt to introduce some other lead compound as a substitute for white lead appears to have a ceaseless charm for inventors, in spite of the very long list of complete and more or less costly failures in that direction. One of the most persevering laborers in this field appears to be Mr. A. French, who is the proprietor of several patents for obtaining the much desired substitute by means of lead "fume" from smelting furnaces. We recently noticed his proposal to make a black paint from the fume by converting it into lead sulphide. He had already patented the use of the fume, caught in a special condenser of which he was joint patentee with Mr. Wilson, as a white paint. By a still later patent he proposes to make use of this fume by acting upon it with hydrochloric acid, and thus producing an oxychloride of lead, which is to give "an excellent white pigment requiring very little oil to form white paint, of the consistency of ordinary white lead." We may take it that the condensed fume of Mr. French's former patent has not been largely adopted as white paint, as he now proposes to further act upon it with hydrochloric acid. It is very curious how the same attempts are made over and over again, and how little many inventors seem to trouble themselves to find out what has been done before them in the same direction. The preparation of a white paint from oxychloride of lead was proposed many years ago by Mr. Pattinson, inventor of the process for desilverizing lead which bears his name. He worked out a very beautiful and successful process for preparing the oxychloride direct from galena, and started a works to carry on the manufacture. The product was very beautiful, but it did not succeed in displacing the white lead, nor in even getting used to any extent alongside of it. The fact is, that notwithstanding the constant assertions of successive inventors that their particular preparation has the "consistency" and all the good qualities of white lead, it has so far invariably been found by the painters that such is not the case, and finally, after all the generations of experimenters, white lead and the old "Dutch" process for making it, still remain practically unaffected by their rivals.—*Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

322,426. SASH-FASTENER. — Winfield S. Cunningham, Springfield, O.
322,434. BENCH-CLAMP. — Hiram C. Fenton, Hartford, Conn.
322,446. REFRIGERATOR - BUILDING. — Joseph F. Hanrahan, Ottawa, Ontario, Can.
322,452. AUTOMATIC SAFETY-GUARD FOR ELEVATORS.—Franklin P. Hinds, Boston, Mass.
322,455. MACHINE FOR SANDING BRICK - MOULDS. Roswell S. Judson and Cyrus J. Hancock, Matteawan, N. Y.
322,457. EXPANSION-JOINT. — Philipp Koch, New York, N. Y.
322,475. STEAM-BOILER. — Benjamin N. Payne, Elmira, N. Y.
322,485. ELEVATOR - HATCH GATE. — Charles T. Schulze, Cincinnati, O.
322,488. DOOR - HANGER. — Samuel Shreffler, Jr., Joliet, Ill.
322,505. MORTISE - LOCK. — Lewis Tighe, Detroit, Mich.
322,513. DOOR - CHECK. — Thomas G. Williamson, Philadelphia, Pa.
322,520. SASH - HOLDER. — Frank P. Catlin, Clayton, Wis.
322,531. TOGGLE-JOINT. — Frederick L. Ellis, New Haven, Conn.
322,549. HEATING-DRUM. — Jas. P. Lydon, Marysville, Cal.
322,553. SASH-FASTENER. — Joseph Paillet, Delaware, O.
322,559. BRICKS, BUILDING - BLOCKS, ETC., MADE OF PURIFIED ASHES AND LIME.—Ernest L. Ransome, Oakland, Cal.
322,563. APPLIANCE FOR LAYING BRICKS.—Martin Reymond, Paterson, N. J.
322,587. CHEMICAL FIRE-EXTINGUISHER.—Joseph A. De Mauclerc, Paris, France.
322,588. SHUTTER-WORKER. — John Dierks, Harlan, Iowa.
322,610.—STOVE OR FURNACE REGULATING DEVICE. Samuel W. Jackson, Chicago, Ill.
322,613. FIRE-ESCAPE. — George W. Kern, Chillicothe, O.
322,626. WATER - CLOSET. — Frank J. Merz, Newark, N. J.
322,631. HOT - AIR FIREPLACE. — Doyel Pearson, Memphis, Tenn.
322,648. DOOR-CHECK.—John H. Shaw, New Haven, Conn.
322,649. DOOR-SPRING. — John H. Shaw, New Haven, Conn.
322,650. GAS-ENGINE. — Cephas Shelburne, Richmond, Va.
322,659. MIXED PAINT.—William H. Van Keuren, Winona, Minn.
322,681. ELECTRIC DOOR - OPENER. — Thomas A. Casey, New York, N. Y.
322,685. AUTOMATIC SPRINKLER. — Frank B. Comins, New Bedford, Mass.
322,707. SASH-CORD FASTENER. — Geo. W. Graves, Norwalk, O.
322,732. VENETIAN BLIND.—William H. Lang, Burlington, Vt.
322,751. COMPOSITION FOR PLASTERING.—John W. Rees, Uniontown, Pa.
322,756. DERRICK.—David Sharp, Lemoore, Cal.
322,763. PNEUMATIC DOOR-CHECK. — George Vincent, Stockton, Cal.
322,790. MACHINE FOR FORMING FLANGES UPON SOFT PIPES.—Milton Chase, Haverhill, Mass.
322,813. STONE-LIFTER. — Daniel English, Brookville, Pa.
322,816. MACHINE FOR PLANING AND FINISHING THIN PIECES OF WOOD. — Addison M. Ford and Jas. M. Moore, Jericho, Vt.
322,819. WOOD-PRESERVING APPARATUS.—Ludvig Hansen and Andrew Smith, Wilmington, N. C.
322,873. FIRE-PROOF CEILING. — Peter B. Wight, Hyde Park, Ill.

SUMMARY OF THE WEEK.

Baltimore.

HOME.—George Archer, architect, has prepared drawings for the Young Women's Christian Association for a three-st'y brick building, 25' x 85', to be erected cor. Barret and Liberty Sts., to cost about $12,000; John Haswell & Son, builders.

BUILDING PERMITS.—Since our last report eighteen permits have been granted, the more important of which are the following: —

S. B. Carey, three-st'y brick building, w s McCulloh St., between Hoffman and Dolphin Sts.

W. F. Stubbs, 5 two-st'y brick buildings, w s Sheppard Alley, between Columbia Ave. and St. Peter Street.

Hoen Building Co., six-st'y brick building, e s North St., n of Lexington St.

S. R. Robinson, 5 three-st'y brick buildings, e s Madison Ave., commencing s e cor. North Ave.

Jos. L. Amos, 14 two-st'y brick buildings, e s Fulton Ave., commencing s e cor. Baker St.

H. A. Zeigler, 5 two-st'y brick buildings, e s Valley St., n of Preston St.

Jacob Oster & Son, 4 two-st'y brick buildings, commencing s o cor. Madison and Constitution Sts.

Boston.

BUILDING PERMITS.—*Millett St.*, Ward 24, 3 two-st'y pitch-roof dwells.; owner, J. P. Carlton.

Tremont St., Ward 25, one-st'y shed; owner, John F. Walsh.

Eastman St., Ward 20, 3 two-st'y pitch-roof dwells.; owner, John H. Gigle.

Church St., Ward 25, two-st'y flat-roof dwell.; owner, John Brennan.

Wesley Ave., Ward 24, three-st'y flat-roof dwell.; owner, Thomas W. Tuttle.

East Eighth St., Ward 14, 2 three-st'y flat-roof dwells. and store; owners, H. C. & A. H. Mensiage.

Foster St., Ward 24, 2 three-st'y flat-roof dwells.; owner, E. E. Currier.

Cobden St., Ward 24, 2 two-st'y pitch-roof dwells. and mechanical office; owner, W. B. Quigley.

Montrose Ave., Ward 21, two-st'y pitch-roof dwell.; owner, J. K. Smyth.

Poplar St., Ward 23, two-st'y pitch-roof dwell.; owner, Mrs. H. B. Leavitt.

Albany St., Ward 17, two-st'y flat-roof shed; owner, A. F. Leatherbee.

Hand Pl., Ward 21, three-st'y flat-roof dwell.; owner, H. J. Bartlett.

Copeland St., Ward 21, 2 two-st'y pitch-roof dwells.; owner, Carl Eberhard.

Everett St., Ward 2, 2 three-st'y flat-roof dwells.; owner, John McCormick.

Ashford St., Ward 25, two-st'y pitch-roof dwell.; owner, Mrs. E. E. Rogers.

Washington St., Ward 23, one-st'y flat-roof structure for mechanical purposes; owner, Thomas J. Tobin.

Englewood Ave., Ward 25, two-st'y pitch-roof dwell.; owner, A. G. Weeks.

Silver St., Ward 15, two-st'y flat-roof stable; owner, H. N. Hatch.

Chelsea St., Ward 1, two-st'y pitch-roof dwell.; owner, Mrs. Margaret Caddy.

Brooklyn.

BUILDING PERMITS. — *Diamond St.*, n e cor. Nassau Ave., three-st'y frame (brick-filled) tenement, gravel roof; cost, $4,300; owner, Wm. H. Hasselbrook, 103 Diamond St.; architect, J. J. Randall.

Clinton Ave., *Nos.* 312 *and* 314, 2 three-st'y brick and Jersey sandstone dwells., tin roofs; cost, $22,000; owner, Henry F. Hutchinson, 308 Clinton Ave.; architect, S. F. Eveleth.

Clifton Pl., *No.* 281, n s, 200' w Nostrand Ave., four-st'y brick tenement, gravel roof; cost, $12,000; owner, architect and builder, J. Graham Glover, 219 Montague St.

Reid Ave., s w cor. Greene Ave., 5 four-st'y brick store and tenements, tin roofs; cost, each, $9,500; owner, architect and builder, H. Grasman, 142 Marcy Ave.

Seventeenth St., n s, 80' w Sixth Ave., three-st'y frame tenement (brick-filled), tin roof; cost, $3,383; owner, Frederick Schwartje, Atlantic Ave., cor. Third Ave.; architect, W. H. Wirth; builders, Powderly & Murphy.

Stockton St., *No.* 295, n s, 125' e Sumner Ave., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Mary Murphy; architect, Th. Engelhardt.

George St., n s, 100' w Knickerbocker Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner and builder, Alex. Eschenbach, South Fifth St.; architect, Th. Engelhardt.

Central Ave., s w cor. Elm St., 4 three-st'y frame (brick-filled) store and tenements, tin roofs; cost, each, $5,000; owner and builder, John Kramer, Bushwick Ave., near Elm St.; architect, Th. Engelhardt.

Berkeley Pl., s s, 289' e Seventh Ave., three-st'y brick and freestone dwell., tin roof; cost, $12,500; owner, David A. Boodry, 206 Berkeley Pl.; architects, J. W. Walter and E. B. Sturges.

Vernon Ave., n s, 155' e Nostrand Ave., two-st'y and attic brick dwell., slate and tin roof; cost, $10,000; owner, Mrs. S. Vanderveer, Vernon Ave., cor. Nostrand Ave.; architects, Parfitt Bros.; builder, A. Miller.

Greene Ave., s s, 120' e Reid Ave., 3 two-st'y and three-st'y rear brown-stone dwells., tin roofs; cost, each, $6,000; owner, B. F. Constable, on premises; architect and contractor, Jos. T. Miller; mason, W. P. Osborn.

Greene Ave., s s, 100' e Reid Ave., two-st'y and basement and three-st'y rear brown-stone dwells., tin roofs; cost, $6,000; owner, Geo. H. Smith, Greene Ave., cor. Reid Ave.; architect, J. T. Miller.

Van Brunt St., s e s, at river front, four-st'y brick storehouse, gravel roof; cost, $30,000; owner, Wm. Beard, 140 Amity St.; builders, P. Kelly & Son and H. Turner.

McDonough St., *No.* 399, between Stuyvesant and Reid Aves., four-st'y brick storage, tin roof; cost, $3,500; owner, John Loader, 401 McDonough St.; architect, A. Hill; builder, A. Sutterlin.

Melrose St., s s, 95' w Hamburg Ave., three-st'y frame (brick-filled) school-house, tin roof; cost, $7,000; owner, St. Leonhards Congregation, on premises; architect, G. Hillenbrand; builders, J. Wagner and W. Bayer.

Hicks St., *No.* 64, w s, 25' n Cranberry St., four-st'y brick tenement, tin roof; cost, $8,500; owner, Henry Stump, 64 Hicks St.; architect, M. Thomas; builders, J. Thatcher and E. S. Boyd & Son.

Clason Ave., *No.* 146, e s, between Myrtle and Park Aves., three-st'y frame (brick-filled) tenement, tin roof; cost, $5,400; owner, Daniel F. Dwyer; architect, J. Platte; builders, J. T. Hanlon and C. Collins.

Seventh Ave., n e cor. Twelfth St., 3 two and three st'y brick store and dwells., tin roofs; cost, $20,000; owner, T. Brown, 381 Eleventh St.; architect, I. D. Reynolds; builder, W. Brown.

Powers St., s s, 142' e Leonard St., two-st'y frame (brick-filled) church, tin roof; cost, $7,500; owners, Trustees Methodist Episcopal Church; architect, G. H. Doolittle; builders, S. V. Hyers and O. H. Doolittle.

Myrtle Ave., n w cor. Graham St., 4 four-st'y brick stores and flats, tin roofs, wooden cornices; cost, each, $12,000; owner, Cornelius Donnellon, 116 Pacific St.; architects, G. P. Chappell & Co.

Halsey St., n s, 179' e Reid Ave., 4 two-st'y brick dwells., tin roofs; cost, each, $3,000; owners, Frederick and John Dhuy, 885 Herkimer St.; builder, J. Dhuy.

ALTERATIONS. — *Prince St.*, w s, 120' s Concord St., two cross-walls of brick; cost, $4,448; owners, Hiblers & Co., Prince St., cor. Concord St.; architect, M. J. Morrill; builders, P. Carlin & Sons.

Marcy Ave., cor. Lynch and Heyward Sts., two-st'y brick extension, wings on both sides, tin roof; cost, $35,000; owner, State of New York; architect, B. F. Gaylor; builders, W. & T. Lamb, Jr., and Jenkins & Gillies.

Chicago.

BUILDING PERMITS. — A. Engle, two-st'y dwell., 556-558 North State St.; cost, $15,000; architect, Halberg.

H. Cassard, 11 two-st'y dwells., 373-387 Thirty-third St.; cost, $20,000.

G. Bennett, two-st'y dwell., 2629 Halsted St.; cost, $3,000.

F. S. Mueller, three-st'y factory, 167-169 Indiana St.; cost, $7,000.

W. M. Hoyt, 2 four-st'y dwells., 240-242 Illinois St.; cost, $8,000.

W. M. Hoyt, 2 four-st'y dwells., 247-249 Illinois St.; cost, $8,000.

T. Kirkwood, two-st'y dwell., 852 Washington Boulevard; cost, $5,000; architect, J. W. Cassell.

F. Hauck, three-st'y shop, 224-228 Blue Island Ave.; cost, $6,000.

H. Hill, three-st'y flats, 346 Twenty-second St.; cost, $4,000.

The Board of Education, three-st'y school-house, 840-860 Twenty-first St.; cost, $58,000; architect, J. J. Flanders.

The Board of Education, three-st'y storehouse, 155-157 West Monroe St.; cost, $10,000.

P. Larsen, three-st'y addition, 120 West Huron St.; cost, $3,500.

F. Stanmer, three-st'y dwell., 212 North State St.; cost, $4,000.

H. Schnell, three-st'y flats, 223 Lincoln St.; cost, $20,000; architect, C. A. Gottig.

C. Cofferta, three-st'y flats, 65 Illinois St.; cost, $3,000.

J. V. Klober, two-st'y dwell., 1-3 Ritchie St.; cost, $4,500.

H. Bower, three-st'y store and dwell., 3750 State St.; cost, $8,000.

K. Sherman, two-st'y dwell., 142 Augusta St.; cost, $5,000.

C. C. Crowhurst, 4 one-st'y cottages, 1061-1067 Elston Ave.; cost, $4,400.

W. L. Moss, agent, 3 three-st'y dwells., 3813-3817 Vincennes Ave.; cost, $16,000.

D. F. Anderson, two-st'y flats, 927 North Hoyne Ave.; cost, $2,500.

W. B. Phillips, 3 three-st'y dwells., 3319-3323 South Park Ave.; cost, $20,000.

P. W. Brownell, three-st'y dwell., 48 Bryant Ave.; cost, $4,000.

Wm. Flynn, two-store and dwell., 795 Thirty-seventh St.; cost, $4,080.

E. Hitchcock, 2 two-st'y dwells., 3251-3253 Rhodes Ave.; cost, $10,000.

G. Weiss, two-st'y dwell., 3410 Wabash Ave.; cost, $10,000.

J. Monohan, two-st'y dwell., 980 West Twelfth St.; cost, $4,500.

C. Sohuelke, two-st'y dwell., 371 West Huron St.; cost, $2,500.

N. Marsh, two-st'y dwell., 362 Centre Ave.; cost, $3,500.

E. Mark, three-st'y dwell., 185 Burling St.; cost, $5,000.

F. Deke, three-st'y store and flats, 412 North Ashland Ave.; cost, $5,000.

Chicago & North Western Railway Co., engine-house, Robey and Fourteenth Sts.; cost, $12,000.

Wm. Hammerstrom, two-st'y dwell., 333 Burling St.; cost, $4,500.

Anson Kaiser, three-st'y flats, 25 Lane St.; cost, $8 000.

Chicago City Railway Co., one-st'y addition, 2001-2009 Dearborn St.; cost, $6,000.

C. Greenwold, six-st'y warehouse, 249-251 Kinzie St.; cost, $15,000.

Wm. W. Hayes, one-st'y additional, 106-108 North Sangamon St.; cost, $3,500.

C. Jevne, two-st'y dwell., 644 Lasalle St.; cost, $20,000.

W. P. Fitzpatrick, 3 two-st'y stores and dwells., Ogden Ave.; cost, $14,000.

M. A. L. Sweeney, three-st'y dwell., 375 Oak St.; cost, $12,000.

G. Paul, two-st'y flats, 618 Sedgwick St.; cost, $5,000.

B. Lindauer, two-st'y dwell., 3312 Wabash Ave.; cost, $10,000.

F. Jensen, three-st'y store and dwell., 23 Clybourne Ave.; cost, $5,000.

F. W. Verhoeven, two-st'y dwell., 2410 Dearborn St.; cost, $4,500.

Mrs. A. Halsted, 2 two-st'y dwells., 708-710 North Park Ave.; cost, $8,000.

C. B. Farwell, repair building, 409 Fifth Ave.; cost, $5,000.

B. Rowe, three-st'y store and dwell., 277 Noble St.; cost, $7,000.

Mrs. J. Clare, two-st'y dwell., 3212 Wabash Ave. cost, $6,000.

McKey Estate, 6 three-st'y store and dwells., 3311-3321 State St.; cost, $30,000.

J. Nolan, two-st'y store and dwell., 3113 Halsted St.; cost, $3,000.

G. F. Mueller, two-st'y store and flats, 651 Centre Ave.; cost, $1,000.

D. Gawne, two-st'y dwell., 3133 Portland Ave.; cost, $2,500.

C. O. Gleason, 2 two-st'y dwells., 3720-3722 Johnson Pl.; cost, $3,500.

C. Schweegler, two-st'y dwell., 599 Lincoln St. cost, $2,500.

J. C. Smith, 2 four-st'y stores and flats, 1018-1020 Madison St.; cost, $13,000.

C. Lion, store, 1155 Milwaukee Ave.; cost, $3,500.

Illinois Vault Co., one additional st'y and repairing building, 111-117 Dearborn St.; cost, $80,000; architects, Burnham & Root.

Cincinnati.

BUILDING PERMITS. — W. C. Cochran, three-st'y building, Gillman Ave.; cost, $5,960.

Jno. Webb, Jr., 4 two-st'y brick buildings, Eden St. and Auburn Ave.; cost, $12,000.

J. Feldham, two-and-one-half-st'y building, Wheeler and Warner Sts.; cost, $7,000.

Wm. More, three-st'y building, Commerce and Walnut Sts.; cost, $27,000.

F. Groveman, three-st'y building, State Ave.; cost, $5,000.

Dr. T. C. Smuk, 2 four-st'y buildings, Breeman St., cor. Thirteenth St.; cost, $10,000.

Fred. Lecke, four-st'y building, Elm St., cor. Fifteenth St.; cost, $6,000.

Miss Romer, remodel building cor. Third and Killgour Sts.; cost, $5,000.

Six repairs; cost, $6,450.

Total repairs to date, $135,363.

Permits to date, 633.

Kansas City, Mo.

BUILDING PERMITS. — J. B. Bott, business block, 1418 Walnut St.; cost, $4,500.

S. C. Fancher, frame business block, cor. Fifth and Lydia Aves.; cost, $4,000.

Trustees of the Christian Church, Summit St., frame church, 40' x 60'; cost, $4,000.

Brockett & Churchill, brick business house, 47 West Ninth St., cost, $3,000.

S. C. Fancher, frame business block, cor. Fifth and Lydia Aves.; cost, $4,000.

William Gabel, brick dwell. 612 Oak St.; cost, $4,000.

William Brendel, brick block, cor. Eighth and Charlotte Sts.: cost, $10,000.

C. H. Hartman, brick business block, cor. Fourth and Grand Aves.; cost, $4,500.

H. T. Hovelmann, dwell., 809 East Eighteenth St.; cost, $3,000.

John S. Sutherland, brick block, cor. Tenth and Cherry Sts.; cost, $6,000.

John O'Leary, frame dwell., cor. Nineteenth and Harrison Sts.; cost, $4,000.

B. Estil, frame block, Harrison St.; cost, $5,000.

Capt. Weller, brick dwell., 100 Oak St.; cost, $3,000.

James S. Mathews, brick block, Dundee Pl., cor. Tracy Ave.; cost, $5,000.

T. M. James, brick dwell., Perry Pl., cor. Harrison St.; cost, $10,000.

Minneapolis, Minn.

BUILDING PERMITS.—J. W. Tousley, two-st'y wooden tenement and barn, cor. Twenty-sixth St. and Williams Ave.: cost, $17,200.

C. P. Hazeltine, addition to wooden dwell., Portland Ave., bet. Twenty-sixth and Twenty-seventh Sts., s; cost, $3,000.

Willard B. Pinneo, two-st'y wooden dwell., Nicollet Ave., bet. Twenty-eighth and Twenty-ninth Sts.; cost, $3,500.

Coe & Forman, four-st'y brick store building, Third Ave., n, bet. Fourth and Fifth Sts.; cost, $18,000.

Joseph Menard, two-st'y brick dwell., Oliver Ave., cor. Fourteenth Ave., n; cost, $3,900.

John Booth, two-st'y wooden dwell., Pennsylvania Ave. cor. Fourteenth Ave., n; cost, $5,500.

Henry F. Brown, two-st'y wooden dwell. and barn, Aldrich Ave., bet. Seventeenth and Eighteenth Aves., n; cost, $5,000.

Minneapolis Gas Light Company, brick retort-house, Cedar Ave. cor. Nineteenth Ave., s; cost, $10,000.

New York.

CHURCH.—On Madison Ave., cor. Eighty-eighth St., a Lutheran church is to be built, from designs of Mr. Arthur Crooks.

FLAT.—On the n w cor. of Sixth Ave. and Fifty-second St., a six-st'y flat with stores, 50' x 100', brick, stone and terra-cotta, is to be built for Mr. Peter Doelger, from plans of Mr. Julius Kastner.

HOUSES.—On the s s of Seventy-second St., between Ninth Ave. and Boulevard, 5 four-st'y and basement dwells., brown-stone fronts, are to be built at a cost of $90,000, from plans of Messrs. Thom & Wilson.

On the n s of Seventy-ninth St., 350' e of Tenth Ave., 6 four-st'y and basement fireproof houses are to be built by Messrs. Hubert, Pirsson & Co.

One Hundred and Fiftieth St. and Boulevard, cottage for Mr. J. Pickering; H. G. Knapp, architect.

On the n s of One Hundred and Twenty-fourth St., 217' e of Sixth Ave., 3 three-st'y and basement houses, two 18' 4" and one 18' front, are to be built for Mr. A. G. Gabay, from designs of Messrs. Thom & Wilson.

MONUMENT.—There is a good deal of interest in regard to the plans for the Grant monument, and it is hoped that there will be an open competition.

SCHOOL.—For St. Anne's Church a brick school is to be built on Brook Ave., opposite One Hundred and Fortieth St., from plans of Mr. C. C. Haight.

BUILDING PERMITS. — *East Thirty-ninth St.*, No. 144, three-st'y brick stable and coach-house, tin roof; cost, $18,000; owner, D. W. James, 40 East Thirty-ninth St.; architect, F. Jacobson; builder, George Mulligan.

West Twentieth St., Nos. 124 *and* 126, three-st'y brick stable, tin roof; cost, $20,000; owner, Hugh O'Neill, 149 West Twentieth St.; architect, M. C. Merritt.

West Thirty-sixth St., No. 67, five-st'y brick flat, tin roof; cost, $30,000; owner, Mrs. Geo. J. McGour, key, on premises; architects, D. & J. Jardine.

Thirty-ninth St., s s, 250' e Eleventh Ave., 6 five-st'y brick tenements, tin roofs; cost, each, $16,000; owner and builder, David Christie, 413 West Fifty-seventh St.

West Forty-eighth St., No. 350, four-st'y brick tenement and extension, tin roof; cost, $4,500; owner, Edward D. Bertine, 328 West Forty-seventh St.; architect, C. F. Ridder, Jr.

Tenth Ave., e s, 75' 6" n Thirtieth St., five-st'y brick tenement with stores, tin roof; owner, Robert Grescen, 427 West Thirtieth St.; architect, J. H. Valentine.

Eighty-first St., n s, 80' w Ave. A, five-st'y brick tenement, tin roof; cost, $12,000; owner, Mathias A. Schneider, 419 East Eighty-first St.; architect, Julius Kastner.

Eighty-first St., n s, 106' w Ave. A, 3 five-st'y brick tenements, tin roofs; cost, total, $50,000; owner and architect, same as last.

One Hundred and Sixth St., s w cor. Lexington Ave., four-st'y brick flat, tin roof; cost, $15,000; owner, Thos. F. Cooke, 351 East Eighty-seventh St.; architect, G. A. Schellenger.

Lexington Ave., e s, 80' 11" s One Hundred and Sixth St., four-st'y brick flat, tin roof; cost, $20,000; owner and architect, same as last.

East One Hundred and Eleventh St., No. 204, one-st'y brick stable, tin roof; cost, $4,000; owner, G. Wallace Bryant, 113 East One Hundred and Eleventh St.; architect, A. Spence.

Third Ave., w s, 25' 2" s One Hundred and Sixth St., 3 five-st'y brick (stone-front) tenements, tin roofs; cost, each, $18,000; owner, John D. Karst, Jr., 2006 Second Ave.; architect, Richard Berger; builder, J. D. Karst.

One Hundred and Nineteenth St., n s, 410' w Fifth Ave., three-st'y brick dwell., tin roof; cost, $10,000; owner and builder, James C. Miller, 359 West Forty-seventh St.; architects, McKim, Mead & White; mason, Joseph Thompson.

Eighty-fourth St., n s, 273' e Ave. A, 5 four-st'y brick (stone-front) tenements, tin roofs; cost, each, $13,500; owners, Schmidt & White, 13 Second Ave.; architect, John Brandt.

East One Hundred and Twenty-fifth St., *Nos.* 320 and 322, 2 five-st'y brick (stone-front) tenements, tin roofs; cost, each, $15,000; owner, Fernando Yost, 316 East One Hundred and Twenty-fifth St.; architect, A. Spence.

Seventieth St., n s, 225' e Eleventh Ave., 3 three-st'y and basement brick dwells., tin roofs; cost, each, $9,000; owner, E. Stanton Riker, Mt. Vernon, N. Y.; architect, W. H. Youngs; mason, H. A. Donnelly.

West Eighty-second St., *Nos.* 426–434, 5 four-st'y brick dwells., tin and slate roofs; cost, each, $25,000; owner and builder, Virgilio Del Genovese, 268 Bowery; architect, Emanuel Gandolfo.

Eighty-second St., s s, 362' 6" w Ninth Ave., 2 four-st'y brick dwells., deck roofs of tin, mansard fireproof; cost, each, $16,000; owner, Richard V. Lewis, 445 West Eighty-second St., and Henry C. Conger, 436 West Forty-third St.; architects and masons, F. & W. E. Bloodgood.

One Hundred and Nineteenth St., n s, 426' 8" w Fifth Ave., 3 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $8,000; owners and builders, John Miller, 753 Seventh Ave., Wallace Van Dorn, 304 West Thirtieth St., and Joseph Thompson, 256 West Fifty-second St.; architect, J. E. Terhune; mason, Joseph Thompson.

One Hundred and Forty-sixth St., s s, 240' e Tenth Ave., four-st'y brick flat, gravel roof; cost, $10,000; owner, John Donnellon, One Hundred and Forty-sixth St., near S. Nicholas Ave.; architect, B. W. Warner; builders, J. & T. Donnellon.

One Hundred and Sixty-seventh St., s s, 175' e Tenth Ave., three-st'y brick tenement, tin roof; cost, $4,000; owner and builder, Frank Lober, One Hundred and Sixty-sixth St., near Tenth Ave.; architect, Wm. Simpson.

St. Nicholas Ave., e s, 152' s One Hundred and Thirty-third St., 4 five-st'y brick dwells., with extensions, tin roofs; cost, each, $18,000; owner and builder, H. J. Beaudet, 1437 Lexington Ave.; architect, J. H. Valentine.

Eighth Ave., s e cor. One Hundred and Thirty-first St., 2 five-st'y brick tenements, tin roofs; owner, O. C. Ferris, 762 Madison Ave.; architect, J. H. Valentine.

One Hundred and Thirty-first St., s s, 76' 6' e Eighth Ave., four-st'y brick store and tenement, tin roof; owner and architect, same as last.

One Hundred and Thirty-first St., s s, 227' w Fifth Ave., 6 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $10,000; owner, Michael Sampter, Fifth Ave., s w cor. One Hundred and Thirty-first St.; architects, Cleverdon & Putzel.

Morris Ave., w s, 53' 3" s One Hundred and Forty-ninth St., three-st'y brick tenement, tin roof; cost, $10,000; owner, Henry Fallerman, 448 East One Hundred and Forty-ninth St.; architects, Schmidt & Garvin.

West Fiftieth St., *Nos.* 539 *and* 541, 2 five-st'y brick tenements, tin roofs; cost, $11,000 and $13,000; owner, Jacob Schneider, 537 West Fiftieth St., and James Stroh, 533 West Fiftieth St.; architect, James W. Cole; builder, John Jordan.

Fifth Ave., s e cor. Sixty-ninth St., four-st'y brick dwell., slate roof; cost, $90,000; owner, Ogden Mills, 35 Wall St.; architect, R. M. Hunt; builder, D. H. King, Jr.

Sixty-eighth St., s s, 120' w Third Ave., three-st'y brick stable, tin roof; cost, $15,000; owner, Joseph J. O'Donohue, 44 West Fifty-fourth St.; architect, J. M. Dunn; builders, Michael Reid and John Murphy.

Lexington Ave., No. 1773, three-st'y and basement brick (stone front) dwell., tin roof; cost, $8,000; owner, Hannah M. French, 152 East One Hundred and Eleventh St.; architect. A. Spence.

Seventy-second St., s s, 300' e Tenth Ave., 5 four-st'y and basement brick (stone front) dwells., tin roofs; cost, each, $25,000; owner, Geo. J. Hamilton, 2078 Fifth Ave.; architects, Thom & Wilson, builder, not selected.

One Hundred and Sixteenth St., n s, 100' w New Ave., 3 three-st'y brick dwells., tin roofs; cost, each, $8,000; owner, Howard D. Hamm, 162 East One Hundred and Twenty-third St.; architects, Cleverdon & Putzel.

One Hundred and Thirty-first St., n s, 75' w Sixth Ave., 4 three-st'y brick (stone front) dwells., tin roofs; cost, each, $10,600; owner, Samuel O. Wright, West One Hundred and Thirtieth St.; architects, Cleverdon & Putzel.

One Hundred and Thirty-second St., s s, 375' w Sixth Ave., 3 three-st'y brick (stone front) dwells., tin roofs; cost, each, $9,000; owner, S. J. Wright, 201 West One Hundred and Thirtieth St.; architects, same as last.

Eighth Ave., w s, 149' 11" s One Hundred and Thirty-third St., 3 five-st'y brick tenements with stores, tin roofs; cost, each, $18,000; owner and builder, Homer J. Beaudet, 1437 Lexington Ave.; architect, J. H. Valentine.

St. Nicholas Ave., e s, 75' n One Hundred and Twenty-sixth St., 3 three-st'y brick dwells., tin roofs; cost, each, $10,000; owner, Nassau Building Co., 20 Nassau St.; architect, A. I. Finkle.

Grounds of St. John's College, Fordham, 500' n Pelham Ave., three-st'y stone boiler-house, slated roof; cost, $35,000; owner, Rev. F. P. Dealy, St. John's College, Fordham; architect, P. C. Kelly; builders, McGivney & McLoughlin and J. Rodgers.

Courtlandt Ave., s e cor. One Hundred and Fifty-ninth St., 2 four-st'y brick tenements, tin roofs; cost, $7,500 and $10,000; owner, Wm. Wolfarth, cor. Courtlandt and One Hundred and Fifty-eighth St.; architect, Wm. Kusche.

ALTERATIONS. — *Third Ave.*, *No.* 755, altered for double tenement above store floor, new show-window; cost, $5,000; owner, M. P. Breslin, 114 East Seventieth St.; architect, J. B. Franklin; builder, J. Young.

Sixth Ave., *No.* 330, two-st'y brick extension, irregular tin roof; cost, $6,000; owners, Henry Moffet, et al., trustees, 328 Sixth Ave.; architect, H. R. Marshall.

West Forty-seventh St., *No.* 13, two-st'y and basement brick extension, tin roof; cost, $10,000; owner, Charles F. Southmayd, on premises; architect, W. Schickel; builders, J. Webb & Son and J. Downey.

East Fourteenth St., *No.* 20, new iron front; cost, $3,800; owner, W. J. Fielding, New Britain, Conn.; architect, A. Craig; builders, Jones, Archer & Co.

West Forty-fifth St., *No.* 226, raised two stories; cost, $6,000; rector, S. M. Brown, on premises; architect, S. D. Hatch; builders, R. L. Darragh & Co.

Courtlandt Ave., *Nos.* 624 *and* 626, raised one st'y also three-st'y frame extension, tin roofs; cost, $3,500; owner, Jacob Santer, 502 East Seventeenth St.; builder, L. Sauter.

Fifth Ave., *No.* 483, five-st'y and one-st'y brick extension, tin roofs; cost, $10,000; owner, James McCreery, Inwood; architect, John Sexton; builder, E. H. Miller.

Fourth Ave., *No.* 107, attic raised to full story, also internal alterations; cost, $5,000; owners, Wm. T. Smith and Percival C. Smith, Great Neck, L. I.; architects, Burger & Baylies.

West Thirty-eighth St., *No.* 430, one-st'y brick extension, tin roof; cost, $5,000; owners, T. C. Lyman & Co., 418 West Thirty-eighth St.; architects, Lederle & Co.

Philadelphia.

BUILDING PERMITS. — *Chew Ave.*, cor. Chelton Ave., 2 three-st'y dwells., 18' x 48'; Jas. Morris, contractor.

Fifty-first St., cor. Florence St., two-st'y dwell., 16' x 30'; And. Mately, contractor.

Sixty-fourth St., cor. Elmwood Ave., two-st'y dwell., 32' x 42'; Jno. Wood, contractor.

Forty-ninth St., n e cor. Paschall St., 2 two-st'y dwells., 14' x 40'; Jno. Wood, contractor.

Second St., s w cor. Moore St., 3 two-st'y dwells., 15' x 50'; Dunbar & Myers, contractors.

Germantown Ave., No. 1425, three-st'y dwell., 20' x 64'; E. Schmidt, contractor.

Germantown Ave., No. 1425, brewery, 16' x 39'; E. Schmidt, contractor.

Germantown Ave., *No.* 1423, bottling-house and stable, 16' x 42' and 20' x 60'; E. Schmidt, contractor.

Germantown Ave., No. 1423, three st'y dwell., 20' x 64'; E. Schmidt. contractor.

Malvern St., s of Clearfield St., 2 two-st'y dwells., 18' x 42'; J. K. Pyle, owner.

Funk St., cor. Ditman St., two-st'y dwell., 16' x 45'; Duryea & Childs, contractors.

Funk St., cor. Ditman St., two-st'y dwell., 25' x 30'; Duryea & Childs, contractor.

North Ninth St., *No.* 2613, two-st'y store and dwell., 18' x 55'; F. A. Colamer, contractor.

Fairhill St., n Lehigh Ave., two-st'y dwell., 17' x 44'; F. A. Colamer, contractor.

Sixteenth St., above Columbia Ave., 5 three-st'y dwells., 18' x 68'; C. M. Baker, owner.

Coral St., n Adams St., one-st'y addition 45' x 160'; S. Humphries, contractor.

Memphis St., above Montgomery Ave., 2 two-st'y dwells., 16' x 38'; S. Humphries, contractor.

Amboy St., *No.* 1616, addition to dwell., 16' x 38'; J. F. Hutzell, owner.

Gowen Ave., two-st'y dwell., 30 x' 45'; W. R. Dougherty, contractor.

Ashmead St., e Morris St., three-st'y dwell., 16' x 30'; W. E. Carr, contractor.

Filbert St., *No.* 171, five-st'y store, 20' x 117' C. D. Supplee, contractor.

Kirkbride St., s w cor. Garden St., three-st'y store and dwell., 18' x 56'; A. W. Linn, contractor.

Fifteenth St., cor. Race St., two-st'y store, 18' x 35'; Geo. Watson, contractor.

Catharine St., *No.* 1432, three-st'y dwell., 18' x 62'; Jno. Eccles, contractor.

Germantown Ave., s Coulter St., three-st'y brick building, 20' x 48'; W. Mackey, contractor.

Chelton Ave., near Chew St., two-st'y dwell., 16' x 42'; W. Mackey, contractor.

St. Louis.

BUILDING PERMITS. — Thirty-two permits have been issued since our last report, ten of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

H. A. Abele, two-st'y brick dwell.; cost, $3,600; contractor, Jos. Stander.

J. H. Degenhardt, two-st'y brick dwell.; cost, $2,500; contractor, A. Lagree.

Boehr & Blogmann, two-st'y double brick dwell.; cost, $3,850; contractors, J. & C. Lingemann.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 503.

AUGUST 15, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE letter which we publish in another column illustrates admirably several of the weaknesses of the present system of competitions. So far as we can understand the Toronto committee seems to have desired to make its competition perfectly fair and creditable to all concerned, and the disappointment which has befallen it, as well as the architects who sent drawings, is due to the lack of experience and technical knowledge which it shares with the managers of nearly every important competition. It will be seen that the clause in the circular on which was based the refusal to award any premiums expressly stipulated that no prize should be awarded to any plan, the execution of which would cost more than two hundred thousand dollars; and while the expert judges undoubtedly felt that this precluded them from recommending the award of the prizes. they say, with reason, that the competitors who violated a condition so distinctly laid down did so at their own risk, and cannot complain of their failure to secure the rewards which were promised only for strict compliance with all the terms of the circular. At first sight this seems fair enough, and one wonders why the competitors should have been dissatisfied with the result; but the truth is that the real enforcement of the clause restricting the cost of designs submitted in competitions is almost unheard of, and as endless examples have shown architects who engage in such contests that it is worse than useless to pay any attention to restrictions of the kind, it is not surprising that the unexpected application of such a test should excite some resentment. In point of fact, the net result of this competition only confirms the usual rule, the young and inexperienced competitors, who were conscientious enough to keep the cost of their designs within the limit, having been coolly cast aside with the remark that none of their plans were suitable for execution, which any expert who compared the limit of cost with the accommodation desired might have predicted at the outset, while seven of those who ignored the restriction altogether, and set themselves to planning a good building without regard to cost, were rewarded, or will be, if the recommendations of the experts are adopted, by selection as contestants in a second and paid competition, with a new and adequate limit of expenditure, and the execution of the building at the usual compensation as the prize. It is needless to point out how demoralizing this is, and how destructive of fair and confidential relations between architects and those who seek their services by the way of competition. Even where the restriction of cost is tacitly disregarded by both parties, and the prizes awarded without reference to it, as was done in a recent important case, where the limit was about half the sum which a suitable building of the kind could be constructed for, injustice is done to these competitors who have made sacrifices in their design for the sake of economy, and at the best, where contestants, as is commonly the case, have to choose between irreconcilable conditions as to accommodation and cost, they are placed at the mercy of the judges, who can, and generally do, waive any conditions which would exclude the designs that they take a fancy to.

BY far the best remedy for this is the abolition of any precise limit of expense in preliminary competitions, which is always perfectly safe. Whatever unpractical committeemen may think, it is impossible to construct a two hundred thousand dollar building for one hundred thousand dollars, any stipulations, terms or conditions of competition to the contrary notwithstanding; and the attempt to make it appear otherwise simply leads to disappointment, bad feeling and increased expense; while everything that can possibly be secured by restricting competing architects to a limited expenditure can be much better obtained, without accusations of bad faith, by making it known that economy of space and material in planning, and sobriety in elevations, will be regarded as an important element in determining the result of the competition. The advice of real experts, not of ordinary builders, checked, perhaps by comparison of the cost, which is easily ascertained, of buildings erected by the Treasury Department, and offering about the same amount of accommodation, will always save committees from making themselves ridiculous by the disproportion between their wants and their means which is now so conspicuous in most public competitions, and with a well-considered programme, drawn up in accordance with the information so obtained, the proportion of cost to the accommodation secured can safely, and with great advantage, be determined by the skill of the designer, in the manner most profitable to all concerned.

ONE of the oldest and most distinguished architects in Europe, Professor Thomas Leverton Donaldson, died last week in his ninetieth year. Professor Donaldson was the son of an architect, and gained under his father's instruction the principles of professional knowledge which were, at the beginning of the present century, little taught elsewhere than in architects' offices. He was an enthusiastic student, following his favorite pursuit with untiring zeal among the ruins, then almost inaccessible, of the Peloponnesus, as well as in Italy and other portions of Europe, and he soon became distinguished by his writings on professional subjects. Devoted equally to the prosaic and the artistic sides of his profession, some of his books are as useful to the young architect in need of practical suggestions as the others are to those who wish for examples of correct Classical detail. His most important archæologial task was probably the study of the temple of Apollo at Bassæ, which he described at length, together with other antiquities of the Morea, in a book which is perhaps the standard work on the subject; but he published also an illustrated description of Pompeii, a collection of drawings of Classical doorways, and many other books and papers of value. Of his practical works the best is perhaps his well-known "*Hand-book of Specifications.*" Among the structures executed under his charge during his long professional career the most important are the Trinity Church and Brompton Church in London, and the great buildings of the London University College, in which he held for many years the professorship of architecture. He was one of the best and most popular of the Presidents of the Royal Institute of British Architects, and manifested the warmest interest in its proceedings long after he had become too feeble to take part in them. For his distinguished services to his profession he was made by the King of the Belgians a Chevalier of the Order of Leopold, and was for a long time a member of the Institute of France, as well as of many other foreign scientific and artistic societies, including our own American Institute of Architects. Learned and faithful as he was in his art, he was perhaps even more esteemed among English architects for his amiable disposition, and the whole profession will mourn one whose kindness and wisdom have been repaid by the younger architects with an almost filial affection.

OUR paragraph of two weeks ago, on the subject of the appropriateness of Riverside Park in New York as the place of interment of General Grant, failed, unfortunately, to meet with the approval of the New York *Evening Post*,

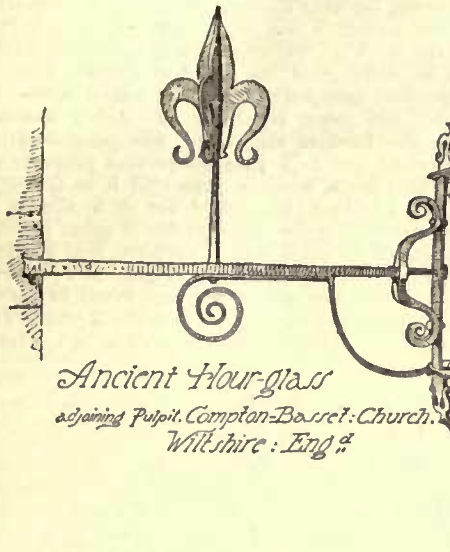
which calls it "the most astonishing of all the manifestations of the curious jealousy excited by General Grant's desire that his body should lie among the people of New York," as well as a "grotesque attack upon the Riverside Park," and suggests further that we "know not well the subtle ways of reaching the noblest urban drive in the world, or apparently anything else about it." Connected with these remarks is a joke, twenty-two lines long, about a misspelled word in our paragraph, which we have laid aside to intimidate our proof-reader with, in case he is caught again in similar carelessness, reserving to ourselves on the present occasion only the task of repelling the various charges of jealousy and ignorance which the *Evening Post* brings against us. The most specific of these, that of not knowing the ways, subtle or otherwise, of getting to the Riverside Drive, we can perhaps best meet by reminding our readers that we have for years on various occasions referred to this street as being precisely what the *Evening Post* calls it, "the noblest urban drive in the world," with the single exception, perhaps, of the famous quay at Geneva. To our taste the New York promenade is superior, the snow mountains at Geneva being too distant to give much character to the view, while the lake and river, although most beautiful, are too small in scale, and seen too close at hand, to afford the majestic impression which is produced by the Hudson panorama as viewed from the Riverside Drive toward the end of a summer afternoon.

IT is the misfortune, however, of the latter that its beauty seems lost on those who have the best opportunities for enjoying it. We spoke of the park in the paragraph which so offended the *Evening Post* as being "neglected and remote," and at the risk of being told again that we know nothing about it, we can only say that the description is literally true. To make sure that some sudden change had not taken place since we last saw it, to justify the *Evening Post's* unfavorable opinion of our veracity, we made a visit to the Riverside Park a few days ago, only to find our previous idea confirmed. The noble and impressive landscape, crossed by the shadows of a summer shower, was, if possible, more enchanting than ever, but of human interest and appreciation there was only the barest sign. For perhaps a mile and a half, along the upper and most beautiful portion of the drive, there are at present *two houses.* One of these is new; the other is apparently forty or fifty years old, and must have stood in the same spot long before the Riverside Park was thought of, so that the new house represents the total amount of appreciation which the "noblest urban drive in the world" has received from the people of the city which owns it within the last five or six years, during which the corresponding eastern portion of the island, uninviting as it is, has been built up with street after street of handsome houses.

WE do not care to upbraid the people of New York about their taste in the choice of building sites; but we must confess that we can see no "curious jealousy" in our original suggestion that if General Grant wished to be buried "among the people of New York," as the *Evening Post*, no doubt with truth, says he did, it is singular that a burial place should have been chosen for him in the very region where he would, if he were in the flesh, be least likely to see any of them. It is true that a lofty monument, even in the deserted region of Riverside Park, will be visible through telescopes for a great distance up and down the river, and may even be viewed near at hand by those who take the trouble to find their way to it, but this sort of lonely grandeur would be, we believe, as distasteful to the "plain man" for whom it is intended as it is repugnant to the best ideas of the artistic commemoration of the dead, which would place the memorial of one whom we wish to have often brought to our minds in a place where we shall see it most frequently, not where it will be conspicuous to our neighbors but well out of our own way. The worst result, however, to be anticipated from this choice of a burial-place is that it will suggest the erection, by way of monument, of one of those "simple shafts" or stately cylinders, to which the site lends itself only too well. Already we find in the newspapers references to the "majesty" or "simple grandeur" of the Washington Monument, a structure which has not in the whole of it the amount of artistic thought that goes to the design of a bed-room chair, and which offers just as much interest to the admirers of Washington's character as a pier of the Brooklyn bridge, and no more. If we would properly commemorate the man whom Providence sent to bring the civil war forever to an end, let us, for once, employ brains as well as money in the task. Let the monument which we raise to him not try to compete with the High Bridge standpipe, but let it be said of it ages hence that those who come to look at it go away inspired with something of the patience, honesty and kindness of him who gained by these great virtues the reverence and affection of fifty millions of people. It is within the power of art to accomplish this, and we predict with confidence that the artist and the people by whom and for whom it is done will gain for themselves and the hero whom they wish to honor a fame which will still be bright when that of the builders of Yankee "obelisks" and other unmeaning lumps of stone has long passed away.

WE have received the prospectus of a Permanent Exhibition of American manufactured goods and raw materials, which is to be opened next November at Rome, under the auspices of the American Consul-General, as well as of various Italian officials. The scheme of the Exhibition is rather novel. Instead of sending his goods out at random, with the prospect of continual annoyance and expense before him, the exhibitor simply secures what space he needs, under a contract for not less than three years, paying for it in advance each year at the rate of fifteen dollars for the first space of ten square feet during the first year, and ten dollars afterward, and ten dollars annually for each additional space of the same extent. Besides this, he is required to pay the cost of transportation to Rome, at a reduction of thirty per cent from the regular rates, and his outlay is then complete. On receiving the goods the managers of the Exhibition become responsible for them, and will at their own expense pay the cost of unpacking and setting them up, together with all custom-house fees or duties, and will see to their proper display and sale, paying for them in advance, if sold, and charging a commission of five per cent on sales. Machinery, if the managers think best, will be shown in motion without expense to the exhibitor. For a fee of fifteen dollars in each case goods may, at the option of the exhibitor, be shown at the local exhibitions, under the management of Government, which are held in forty-one of the principal cities of Italy and Sicily. Besides the financial advantages resulting from the sale of his goods, the exhibitor or his representative is entitled to a reduction of thirty per cent in the cost of his passage to and from New York to Rome, if he wishes to attend the exhibition in person. At the end of three years, the managers will return articles which have been shown during that time, and have proved unsaleable, but efforts will be made, at the discretion, as well as at the expense of the managers, to secure a market for the goods entrusted to them, not only in Italy, but in other countries bordering on the Mediterranean, by means of travelling salesmen and canvassers. The seven groups into which the Exhibition is divided include chemical and pharmaceutical products and processes, with leather and methods of leather manufacture, furniture and upholsterer's work, carpets, paper-hangings, shades, blinds, glass, pottery, cutlery, clocks, watches and jewelry, artistic metal-work, apparatus for heating, cooking and lighting, textile fabrics, arms, travelling apparatus and toys, musical, hygienic, mathematical and photographic goods, food products, mechanical and industrial processes, products and tools of all kinds, electric apparatus, and so on. The managers very sensibly call attention to the fact that Italy, unlike the other countries in which industrial exhibitions are held, is not a manufacturing country, and that goods are desired there for purchase, not for copying; while, as the expense of transportation to Rome or Naples from New York is less than that from France or Austria, our manufacturers are so far placed at least on an equality with those of Europe. We do not pretend to know much about manufacturing business, and therefore forbear to mention the numerous articles of American workmanship which we think might be sold in Italy to great advantage under so favorable an arrangement as the managers of the Exhibition propose; but if any of our readers take a more personal interest in the subject, we advise them to write at once to Adolfo Passano, General Director of the Permanent Exhibition, Rome, Italy, who will send them a copy of one of the clearest and most business-like circulars that we ever came across.

PECULIARITIES OF COUNTRY CHURCHES IN ENGLAND. — III.[1]



Ancient Hour-glass adjoining Pulpit. Compton-Basset: Church. Wiltshire: Engd.

BAPTISTERIES are rare in England, indeed I only know of one of the kind I am about to describe. At the parish church of Luton is an octagonal baptistery about twelve feet high, finished with a spire; it is an exceedingly graceful feature, the sides being open arches with a stone railing between them. In the centre of the octagon, on the floor which is raised two feet from the floor of the church, is the font; this dates from the fifteenth century. Many fonts in out-of-the-way churches have very beautifully carved oak canopies, suspended from the roof, or from iron brackets balanced with weights, so that they are raised or lowered with ease. These for the greater part are carved out of solid blocks of oak, and are usually octagonal, and about two feet wide at the base, tapering to one-inch diameter below the finial. The balance-weight is sometimes a circular



Luton.

brass box, sometimes in the form of a grotesque figure, at others, it is intended to represent a dove. They are not uncommon, but the font cover is often the only good piece of work in an old church, and the visitor is surprised to find it there at all.

Stoups for holy water are uncommon, the general form for this purpose being the piscina. One illustrated some years ago in the *Building News* is of very peculiar form. It is at Lewanick in Cornwall, standing about twenty inches high, and being eighteen inches in diameter at the top. On the top are sunk seven holes about four inches deep by two-and-one-half inches wide, one in the centre, and the others ranged round at equal distances apart. It is believed to be unique, and is of polished granite; its workmanship is very rude, and it dates from 1080. Piscinas and credences hardly come under the intentions of this paper. They are to be found in every chapel, in every church, and are more common therefore than the churches themselves. Sediliæ, the seats used by the celebrant and his two assistant priests, during the sermon or homily are also found in almost every church, so we will pass on to details of less notoriety.

A custom among the Roman Catholics is a "night vigil," and in some churches a chamber was provided where the priest could sit and tell his beads, chanting his psalms, and keeping his watch through the dreary hours of the night. There was no settled position for these chambers, and if space permitted it would be worth while to describe nearly all of them. We will give a few examples. In Grantham, which possesses the finest parish church in the country, the priests' chamber is over the south entrance door, opening into the church with an arch and low parapet wall. At Dorchester, Oxon., it is over the chancel ceiling of the south chapel, directly under the roof, a wood railing being the only protection from a fall of twenty-five feet into the church. This chamber is reached by a staircase at the foot of which is a curious corner doorway at an angle of the chapel, the surrounding stone ornamentation including a large credence and armory. At Compton-Martin in Surrey is another, and this occupies a still more prominent position. The chancel proper is only nine feet high, with a Norman, groined ceiling. The rest of the space up to the ridge is occupied by the chamber, which is twelve feet high.



Grantham.

Rood-lofts and screens probably existed in every church, but a very great many have been destroyed, although their positions can be clearly seen from marks in the walls, though in some instances there is no trace left at all. They are of all dates and styles, some very elaborately treated, others quite plain.

Grotesque carvings are to be found everywhere. Animals are represented listening to sermons preached by foxes. Hideous faces and horribly contorted figures abound, and sometimes either on capitals or poppy-heads short stories are illustrated so well that they can be read without the aid of letter-press description. At Lincoln in the cathedral, on a poppy-head termination to a stall, is the history of three monkeys, and a pat of butter. Two large monkeys are shown making butter with a churn, and a small monkey is greedily eyeing the process, half-hidden by a leaf in the carving. The monkeys turn their backs, and the small one stretches out a long skinny arm, and seizing the production makes off with it with all speed. The next scene shows the vengeance of the butter-makers, who with a rope hang the poor thief to a part of the surrounding foliage, and finally they are seen carrying on a bier for burial, the stiff and lifeless form of the culprit who fell a victim to the promptings of an empty stomach.

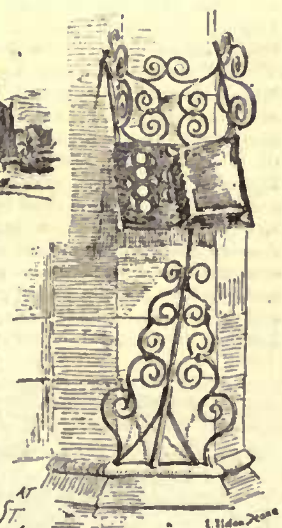


North-Porch-Grantham-Church-Eng.

Chained Bibles, hour-glasses and alms-boxes are deserving of a few remarks. They are relics of the past, for the first two of which there is no use now. Chained Bibles are not so uncommon as hour-glasses, but they are seldom met with. In St. Giles Church, Northampton,



Alnwick, Northampton.



St. Michael's. Alnwick. Eng.

there is a chained Bible, supported by a plain wooden lectern, and secured to it with a chain of links, alternately round and long. But at Alnwick, the bracket which supports the book is as curious as the book itself; it consists of two iron supports projecting from the wall, connected by an iron grate or ornamented shelf, upon which the chained Bible is laid. Alms-boxes, of course, are used still, but the particular form used three, four and five centuries ago is now rare. In the parish church at Newark, the finest but one in the country (the exception Grantham Church already mentioned) is an alms-box, the top of which is two feet six inches from the floor, the box itself is bound with iron, the lid is fastened down, and locked with three immense padlocks, the box stands on a post, sunk some three feet into the ground, to prevent its removal by sacreligious hands; but the size of the padlocks would enable any one with strong wrists to wrench

[1] By R. W. Gambier-Bousfield, A.R.I.B.A., A.A.I.A. Continued from page 63, No. 502.

them from the staples, and to possess himself of the contents of the box. At Hingham-Ferrers an alms-box is placed upon the capping of a pew in place of a poppy-head, while at St. Peter's-in-the-East, Oxford, the box is hung against the wall from an ornamental iron bracket, to which it is secured with a padlock. The churches at Dray-



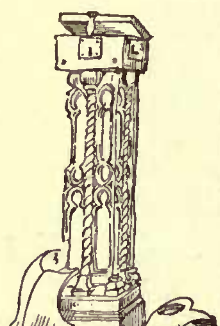
Newerk.



Hinghem-Ferrers Church.

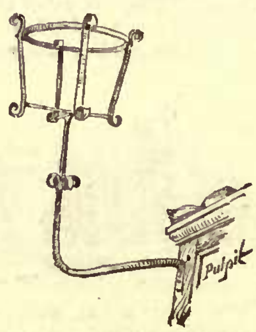
ton, Berkshire, and Meare, Somersetshire, have boxes somewhat like the one described as being in Newark Church; though the designs are different, the principle is the same.

Hour-glasses were used instead of clocks, and were attached to the pulpits and held by iron brackets. There are a few of the old stands existing as at Wolvercot and Beckley, in Oxfordshire and at Edingthorpe, Norfolk. The one at Leigh in Kent, is a good example. The bracket consists of an iron bar about eighteen inches long upon the end of which is a circular basket of open iron-work rather rude and simple, into which the glass was put. These generally date from the middle of the sixteenth century.

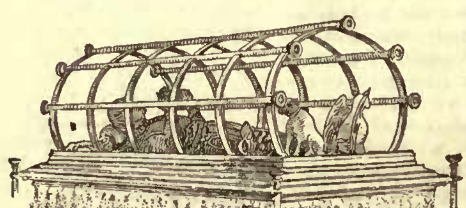


Alms-box, Meare Church, Somarsetshire.

There is one other piece of church furniture that it will be interesting to notice, and that is the "herse." This word, spelt in a variety of ways, is used for "portcullises," but it also signifies "a frame set over the coffin of a deceased person, and covered with a pall." It was very often made of light wood-work, and perhaps that is the reason that there are so few to be found now, the construction being too light to last all these centuries. In the Beauchamp Chapel, at Warwick, there is a brass herse over the effigy of Richard, Earl of Warwick, the form of which is five long bars of the length of the tomb, finished with knobs at the ends, the bars resting on six brass arches, placed at equal distances apart along the top of the tomb and let into the stone; its height is two feet. There is an iron one over a tomb in Bedell Church, Yorkshire, and another over the tomb of one of the Marmions in West Tanfield Church, Yorkshire, to which church I have had occasion to refer before. The contract for the erection of the tomb of Richard, Earl of Warwick, who died in the reign of Henry VI is extant, and contains this sentence, "Also they shall make in like wise, and like latten, a hearse to be dressed and set upon the same stone, over the image to beare a covering to be ordeyned." A very great many interesting discoveries have been made in churches and cathedrals in the last few years during restorations and repairs, and it is in many instances to mere accident that we owe the discovery of some exquisite carving and fresco painting, and many things that are now of priceless value to the antiquarian. The late Sir Gilbert Scott in his autobiography relates a discovery made by himself at St. Alban's Abbey, Hertfordshire. He says: "We found under the south-east pier (of the great central tower) the evidence of a marvellous fact. Its foundations had been excavated into a sort of cave, some five or six feet in diameter, which had been filled in with rubbish, mere dust with some timber struts among it. I can only conceive that this had been done with the intention of destroying the building by setting fire to the struts, but that the process had been suspended."

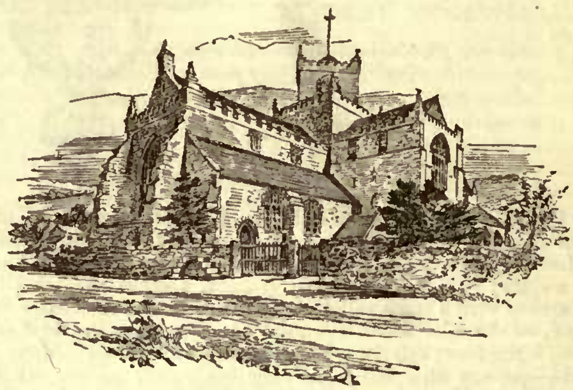


Hour-Glass. Edingthorpe Church, Norfolk.



Herse over Tomb of Earl Warwick, Beauchamp Chapel, Warwick.

In a foot-note, the editor, a son of the author, adds, "It appears that when the work of destruction was countermanded, no pains were taken to make good the mischief already done, and the tower has remained propped-up on short oaken struts from the Reformation until the recent repairs." The Abbey was saved from destruction by the Lord of the Manor, who purchased it for the sum of £400 sterling, and kept it as his private property until the excitement had died down, when he presented it to the city, so that this glorious pile has been left intact for us to admire, and has lately given an opportunity for the exercise of great ingenuity and skill, in the raising of the south wall of the nave, that had fallen several degrees from the perpendicular to its original and proper position. Several churches of less importance were saved in the same way. Cartmel Church, Lancashire, illustrated in the *Architect* (London) some time ago, was the parochial as well as a conventual



Cartmel Church, Lancashire.

church, and the parishioners were allowed to save it by purchase at an exorbitant price. Frescoes and carvings were covered with plaster, and have remained concealed, forgotten, until the present time. In the church at Hawton, in Newark, already mentioned, besides the Easter sepulchre that was buried in plaster, there is also a very finely carved sedilia in excellent preservation. Frescoes were discovered in Winchester Cathedral and in Lincoln; when the supposed pillars of limestone were being cleaned down, it was found that they were of Purbeck marble, purple in color, buried in plaster an inch thick; these have now been repolished, and the effect produced by the marble and sandstone is lovely. We can value these things more than could the people of a hundred years ago, so we may be thankful that they have been left undiscovered to this date. As long as there are churches to be restored, so long will there be discoveries made, and while there are students to look into these details, there will be always plenty to furnish them with interest and instruction. Although the island is comparatively so small, it contains hundreds of thousands of architectural gems, and this cursory glance at a few of them may show that many almost unheard of places are worthy of a visit by the architectural student. People walk so much more in the old country than they do here, that a long holiday may be spent in good weather for a very small sum, and certainly there is no better way of seeing a country than to walk. Ladies, even, take walking tours now with their light knapsacks on their shoulders, and their sketching utensils put upon them, and together with their fathers and brothers who have a taste for the same work cover some twenty miles a day, making their sketches when anything of particular interest comes in view. It is by no means necessary to go abroad to find objects to make an interesting holiday, as I hope this paper will have clearly demonstrated.

STROLLS ABOUT MEXICO. — VI.

FROM THE PLAZA TO CHAPULTEPEC.



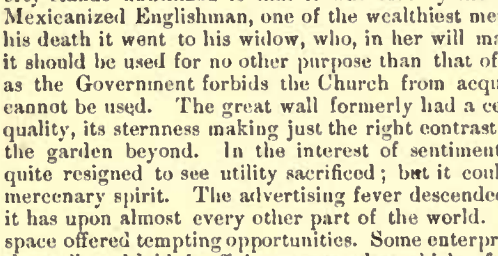
Statua of Carlos IV., City of Mexico.

THE favorite route for a morning constitutional in Mexico is along the busy main thoroughfare, which runs from the great central plaza to the circle whence radiate three great avenues leading out of town, and along the chief of these, the grand Paseo de la Reforma, out to, or towards Chapultepec. This main thoroughfare, the Broadway of Mexico, is a narrow street which has a different name for each of its sections, which are respectively the first and second Plateros, the Profesa, the first, second, third and bridge of San Francisco, and the Avenida de Juarez. This custom of giving a different name to each section of a street prevails in the capital, and in the greater number of Mexican cities, though in some places I have found

that the sensible modern plan of consecutive names and house-numbers has been adopted. This confusing system is probably an old Spanish, and perhaps, generally European custom. Old-time Boston, it will be remembered, had something of the sort to a certain extent, what is now Washington Street, having been originally Cornhill, Marlborough, Newbury and Orange Streets. Historical associations will generally be found in these various names. And those parts known as the Plateros, for instance, are said to have been the houses of the dealers in silver, upon which precious metal the wealth of Mexico was founded. Upon the section known as the Profesa is the great church of that name, one of the most fashionable in the city. The great convent of San Francisco, which covered an enormous tract, gave its name to four sections, the last of which, the bridge, or Puente de San Francisco, preserves the memory of the time when the entire city was intersected by canals, making Mexico the Venice of the western world. Most of the buildings bordering the streets are old, some of them two hundred and fifty years or more. While the ground floors are devoted to business, the upper stories are dwellings, where they are not hotels. One great and massive block was built by Borda, who made several fortunes in silver-mining, in which his career was strikingly romantic. We pass the great Hotel Iturbide, once the palace of the unfortunate emperor whose name it bears, and whose grandson receives a magnificent income from its profits. It is one of the tallest buildings in Mexico, and with the adjacent Hotel San Carlos, which forms part of the same property, it covers more territory than most of our great American city hotels. Just beyond we come upon the district formerly occupied by the great convent of San Francisco. Its present condition might induce the old monks to turn in their graves. Of all this once magnificent estate, the mother Church retains no parcel, although upon one bit she has a feeble but negative clutch. "Though mine no longer, no other than the Church shall use it," she says. Strange faiths worship here now, and heresies are preached where once beneath the vaulted arches echoed the litanies of the faithful. Surrounded by the homes of trade, a blank, buttressed wall, tremendously massive, rises from the street. This wall supports a barrel-arched roof. Beyond is a handsome gateway, facing which stands the richly-sculptured façade of a church, approached through a garden with the accustomed Mexican brilliancy of bloom brightening the luminous shadows of trees, and old walls robed with trailing vines. It is a charming bit of quiet, off the busy street. The building of which the blank wall forms a part, also has an ornate façade upon this garden. The church, once the principal sanctuary of the old convent, is now the cathedral for the Anglican communion in Mexico. The chapel to which the blank wall belongs is gradually tumbling to pieces. The reason why this valuable property stands unutilized is that it was sold by the Government to a Mexicanized Englishman, one of the wealthiest men in the city. On his death it went to his widow, who, in her will made provision that it should be used for no other purpose than that of the Church, and as the Government forbids the Church from acquiring property, it cannot be used. The great wall formerly had a certain picturesque quality, its sternness making just the right contrast for the beauty of the garden beyond. In the interest of sentiment I was therefore quite resigned to see utility sacrificed; but it could not escape the mercenary spirit. The advertising fever descended upon Mexico, as it has upon almost every other part of the world. The great blank space offered tempting opportunities. Some enterprising person hired the wall, and laid it off into rectangles, which, after the manner of the drop-curtains in Mexican theatres, were leased by advertisers, and covered with a hideous patchwork of most ill-assorted colors. I am now anxious to see that will broken, and the old chapel speedily demolished to make way for a business structure.

Across the way are the houses of the Barron-Forbes and the Iturbe families, two of the richest in Mexico, and through the great doorways we catch inviting glimpses of noble court-yards surrounded by handsome gallery corridors, with fountains, statuary, and blooming plants in large vases. The Iturbe house, which is upon the corner of a little square, the Plazuela de Guardiola, is one of the most notable-looking houses in Mexico, being covered with blue-and-white decorated tiles. In the court or *pátio*, these tiles have a highly luxurious effect. One of the most imposing buildings in the city faces the street from this square. It is the Escandon house or palace, as it might be called. It has a broad noble façade, with a grand portico of beautiful columns; a chaste Renaissance with Classic motives dominant.

A few steps more bring us to the Alameda, which is to Mexico what the Common is to Boston. It is a long rectangle of something like fifteen acres, I should say. Its plan is admirable, combining the formality which is essential to the convenience of use for a pleasure ground in the heart of a great city, with the grace which a garden needs to give the sense of quiet and seclusion that may be had in a much frequented place. Wide paths intersect the ground at right angles from side to side, and diagonally from corners to corners, not only of the garden, but of the four minor rectangles into which it is thus cut. These paths form beautiful avenues beneath the dense shade of the ash and cotton-woods, interspersed with eucalyptus, which form a grove-like growth over much of the place. At their intersection are rondels with finely-designed carved stone seats around basins with fountains and aquatic plants. Small curving paths lead through the spaces lying between the larger ways, with turf, flowers and shrubbery, and here and there, perhaps in the neighborhood of a pine, a date-palm — which does not bear fruit at this altitude. We have here abutilons with beautifully varied blossoms growing twenty and twenty-five feet high, like young maples. Something akin to our humble doorway weed, the common mallow, also grows here, a tree-like shrub, with handsome large blossoms. But one of the grandest flowers is a great bell-shaped blossom, several inches long, creamy white, and at night saturating the air with its delicious perfume. Here the students come with their books, and walk up and down in the pleasant shade, studying their lessons aloud, just as they probably learned them in their childhood, for the Mexican children, like the Chinese, study their lessons aloud in school, so that, as we pass a school-house a Babel of sound floats out of the open windows, and a stranger thinks a grand disturbance is in progress, until experience teaches him that the same rumpus is always going on there. The beauty of the Alameda is appreciated, for it is always full of romping children, nurses with babies, and people of all conditions out for an airing.



General Scheme of the Alameda.

We pass along down the wide Avenida de Juarez, to the great circle already mentioned. Here stands the great statue of King Carlos IV of Spain, made by a Mexican sculptor, and called one of the few great equestrian statues in the world. It has a simple, most impressive dignity, with the largeness of conception which can afford to dispense with minuteness of detail. The sturdy steed plods steadily along, and the pose of the monarch as he reaches out his hand in greeting to the people is admirable. It is to the credit of Mexico, that in the storm of republican enthusiasm, hatred of royalty was not permitted to destroy this splendid example of native genius,[1] but that it was "preserved as a work of art," as its inscription says, in inferential contempt of the monarch. Mexico at this point has all the grandeur of a great capital; it seems something like a combination of Washington and some European centre. Five thoroughfares radiate from this point. The chief of these, the Paseo de la Reforma, makes an angle considerably to the left, in the line by which we have come from the main plaza, and runs straight out to the Castle of Chapultepec. A continuation of the line out of the heart of the city runs out to the Colonia de los Arquitectos, a new section of the city where some detached houses pleasantly situated, but nightmareishly fantastic in design and decoration, do little honor to the name of the place, which would indicate that Mexican architects had sadly degenerated of late. To the left, the Paseo de Bucarelli, named in honor of one of the viceroys, has a majestic background in the lofty mountain of Ajusco, the third in height in the titanic wall which guards the valley. This avenue formerly approached Chapultepec by a roundabout way, intersecting the road that runs along the southern of the two great aqueducts supplying the city. For ornamentation it has two picturesquely dilapidated fountains of a Rococo character. Since the opening of the new Paseo, the former has fallen into disuse as a pleasure drive, although it has the making of a beautiful avenue.

The Paseo de la Reforma was laid out by Maximilian, who did much to embellish the capital. It has been called the grandest pleasure-drive in the world. Taking it all in all, including its environment of mountain scenery, I have never seen its equal. It is nearly two miles long, and very broad, bordered with four rows of trees. At intervals it broadens into six circles which are designed to be occupied with monuments to men eminent in Spanish-American history. The first of these is to Columbus, a splendidly-designed work, presented to the city by Mr. Escandon, one of the projectors of the Vera Cruz Railway, and which it was originally intended to place in the Plaza de Buena Vista, in front of the railway station. The next circle has just been filled with a monument to Guautemoctzin, the last of the Aztec emperors. This is the work of Noreña, a highly talented Mexican sculptor. The pedestal is in the Aztec style, and the statue which occupies it portrays an heroic, youthful figure of the Aztec type, to make the studies for which Noreña went to a part of the country occupied by a race of splendid physical development, which has never yet recognized the authority of the Church or State, but still maintains its Pagan cultus. The next circle, it is said, will be occupied by a monument to Cortez, the first to be erected in memory of the great conqueror. The remaining three circles are, as yet, unprovided for. Probably Maximilian, when he laid out this grand avenue as the Paseo de la Imperadora (Paseo of the Empress), dreamed of seeing his own effigy occupying some day a place by no means the least among the monuments of the magnificent empire he hoped to dominate. It seems not unlikely that two of the future monuments will be dedicated respectively to Hidalgo, the father of Mexican independence, and to Juarez, the leader of the war of reform, and of the struggle which overthrew Maximilian, giving Mexico its

[1] Carlos IV Statue, by Tolsa. Of this statue Humboldt wrote enthusiastically, calling it "a work which, with the exception of the Marcus Aurelius at Rome, surpasses in beauty and purity of style everything which remains in this way in Europe." Tolsa, who was director of the Academy of Fine Arts, and professor of sculpture there, also made a bust of Cortez, which adorned the sepulchral monument consecrated to the hero in a chapel of the Hospital de Naturales, erected by the Duke de Monteleone, a descendant of Cortez.

present truly Republican constitution and restoring it to Republican rule.

In the morning hours the Paseo is frequented by horseback riders. The graceful steeds of Andalusian-Arabian descent, with handsome, intelligent heads, thick and flowing manes and tails, their riders generally in becoming *charro* costume of short jacket, broad sombrero with heavy silver braid, and rows of silver buttons down the seams of their tight-fitting pantaloons; these features give to the scene an element of picturesqueness such as is found nowhere else west of Hungary. All through the morning there is also much walking, and many stroll out to the delightful swimming-baths near the Columbus Monument. Late in the afternoon is the hour for driving, and all the fashionable world is out, making a sight as animated as Rotten Row, or the Bois.

What a glorious tonic are these mornings on the Paseo! Nature, always serenely joyous and noble of aspect, gladdens the eye and rejoices the heart. The air has the bracing, vigorous quality given by an altitude of nearly a mile-and-a-half above the sea-level. We are beyond the taint of the city's breath. The aromatic scent of the tall eucalyptus trees bordering our way is wafted gently down to us, mingled with the odor of the level meadows which stretch on either side, with two ancient aqueducts peeping under the trees not far away, and gradually converging as we approach Chapultepec. All around rise the mountain walls, lofty towering, and ever changing with the atmospheric mood of the day and hour.

At the end of the Paseo we pass through the *Garita*, or municipal custom-house gate, which marks the boundary of the city, and crossing a road, enter the Park of Chapultepec. Above us is the castle, standing on the summit of a rocky hill completely isolated, rising abruptly on this side, and more gently beyond. Around the hill lies a grove of some of the grandest trees in the world, the *ahuahuete*, or taxus. They were sylvan giants when the conquerors come, three-and-a-half centuries ago, and are of unknown antiquity. Streamers of long gray moss are pendant from their branches, and give them a venerable aspect as they stand in solemn aisles. [See Illustrations].

The castle itself would be more impressive were it built in a mediæval, or more appropriately Aztec fashion. But a site like this is enough to give dignity to any structure not absolutely discordant with its surroundings. Its fault is a lack of emphasis. There is too great uniformity of horizontal lines; a single round tower, rising from an interior court, being the only prominent feature of relief, when viewed from a distance. Near at hand the structure gains in interest. The light arcades of the loggias in front give an aerial grace. A road curves around the hill in easy ascending grades. The buildings of the national military school, the West Point of Mexico, adjoin the castle. The cadets, who are mostly handsome lads, entering the school at an earlier age than do our West Pointers, certainly have a rare opportunity for educating their sense of landscape beauty. A young lieutenant, who had graduated at the school and was detailed as an instructor, told me that never had the scene palled upon him; each day it seemed as wonderfully beautiful as ever. The glory of this lordly panorama unrolled from the terrace of Chapultepec has been often described, but no pen can do it justice, no painter can reproduce its spirit. Before us the historic city crouches low amidst its garden-like setting, as if humbled by its insignificance in the presence of the dazzling snowy peaks piercing the eternal blue of heaven. But I will not attempt to describe the indescribable.

The castle had been unoccupied since it was the Imperial Palace for Maximilian and Carlotta, who here found peaceful, joyous relief amidst the tragedy of their reign, as they looked out over the land which they deemed theirs "by the grace of God," as monarchs say. At my last visit it was undergoing repairs in preparation for its use as the official Presidential residence, and it was to be adorned and furnished in befitting style by a New York firm of decorators. How cheap appeared the tawdry wall-papers which had been upon the walls of the rooms since they were placed there under Maximilian, their crude effect heightened by the shabbiness of nearly two decades of neglect! Such paper would be hardly tolerated to-day in a third-rate New York boarding-house. Was it possible that the Imperial pair had such wretched taste? I stepped from the ugliness of in-doors into the charming hanging-garden which occupied the roof of a large part of the castle. What a paradise it was!

Sylvester Baxter.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

PALAZZO FOSCARI, VENICE.

One of the later specimens of the Venetian Gothic, built about 1452, by Doge Francesco Foscari, who having bought from the Government the old one, named Delle due Torri (of the two towers), raised the new one higher than the Giustiniani Palace close by, in order that it should not appear like a continuation of it.

Sansovino, the historian, though a Renaissance man, places the Palazzo Foscari above the best palaces of his own time, so far as the situation is concerned, dominating as it does two large reaches of the Grand Canal, and describes it as *d'uso tedesco* (built according to the German fashion). The façade is certainly the noblest of this period; its traceries are imitations of those of the Ducal Palace, and the upper ones correspond with those of the *Ca' d'Oro*. The capitals have all the decorative richness and technical dexterity of intaglio as those of the later portion of the Ducal Palace towards the Piazzetta.

The two shields held by genii on the frieze above the second floor are the arms of the Foscari, and two similar ones decorate the *Porta della Carta*, built by the same Doge. The shields on the façade of the palace have been partly defaced in order to destroy the small lion which occupied one quarter. We know, however, that very few sculptured lions remain upon the public buildings in Venice, having nearly all been blown to pieces when the Republic fell, which makes it more interesting to find the lion left on the shield decorating the street entrance of this same Palazzo Foscari: in order to conceal it it is said to have been plastered over in the year 1797, and uncovered again when the storm of the Revolution was passed, and so it has come down to us uninjured.

Owing to its beautiful situation, the Palazzo Foscari has been assigned by the Republic as residence of many notable personages who visited Venice; the Emperor Frederic the III; in the year 1574 to Henry III of France; and in 1709 to King Ferdinand of Denmark: since then it has been devoted to several purposes, and it now contains the School of Commerce.

DESIGN FOR A NEWSBOYS' LODGING-HOUSE. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

The drawings published in this issue are those submitted in competition for a newsboys' lodging-house, which is to be erected in New York city by the Children's Aid Society, and were returned to the architect, with thanks, by the Building Committee.

It was proposed to treat the exterior as follows: Basement up to the sills of first-story windows faced with rock-faced Belleville brownstone. From this level to the cornice just over the first-story windows the body and trimmings of two shades and texture of red brick, the body being a rough, light-red Collabaugh brick; the quoins, jambs, etc., of a dark brownish pressed brick. Above the level of the second-story floor, the body of the walls it was proposed to face with a russet brick (about the color of dark toast), and trim throughout with the dark-red brick used below, except in the case of moulded and modelled work, which would have been terra-cotta. It was suggested to cover the exposed roof with blackish vetrified roofing-tiles, with cresting finials, etc., of same material. The floor plans explain themselves, and present nothing of special importance except the effort to meet the conditions of the building, which is to be used as a combination school and lodging-house with a limited amount of space and money at the architect's disposal.

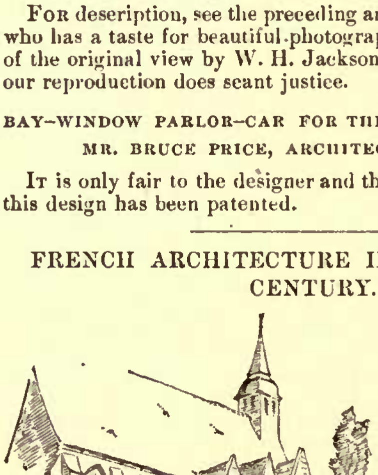
THE CASTLE, CHAPULTEPEC, MEXICO.

For description, see the preceding article. We recommend any one who has a taste for beautiful photographs, as such, to procure a copy of the original view by W. H. Jackson & Co., Denver, Col., to which our reproduction does scant justice.

BAY-WINDOW PARLOR-CAR FOR THE PENNSYLVANIA RAILROAD. MR. BRUCE PRICE, ARCHITECT, NEW YORK N. Y.

It is only fair to the designer and the railroad company to say that this design has been patented.

FRENCH ARCHITECTURE IN THE NINETEENTH CENTURY.[1]—II.



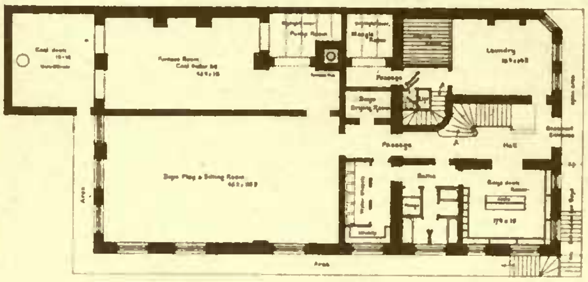
Church at Abbeville, France.

The French style of this century has been differently called the Romantic and the Neo-Grec. The first name, though natural to the time when it was given, is hardly in keeping with the classic feeling and finish of the work, and suggests a parallel with the naturalistic feeling of the Romantic schools in painting and literature which does not hold; the other name, though better fitting, is hardly characteristic. Although the details are Greek, the style is not Greek. In fact, I suppose that the modern works which look most as if they might have been built by Greeks are to be found in Scotland, in the buildings, say, of Hamilton and Thompson, and in Germany in those, say, of Klenze, simply because those artists have made a thorough surrender of their individual ways in the effort to enter into sympathy with the Greeks, and to do what they thought the Greeks themselves might have done in Greece; but the French hold too fast to their own habits for this, and they have done with their Greek material much as the Greeks themselves did with the Egyptian and Oriental material which they collected, and what their early Renaissance architects did with the Roman Orders and details which they imported from Italy; that is, they have bent them freely to their own ways, and the resulting architecture is not Greek but French, as it ought to be.

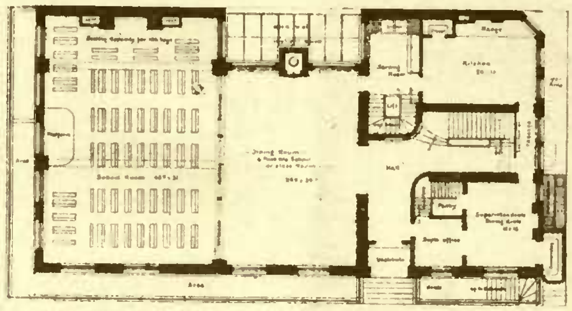
About 1826 there were together in the French Academy at Rome

[1] Continued from page 40, No. 500.

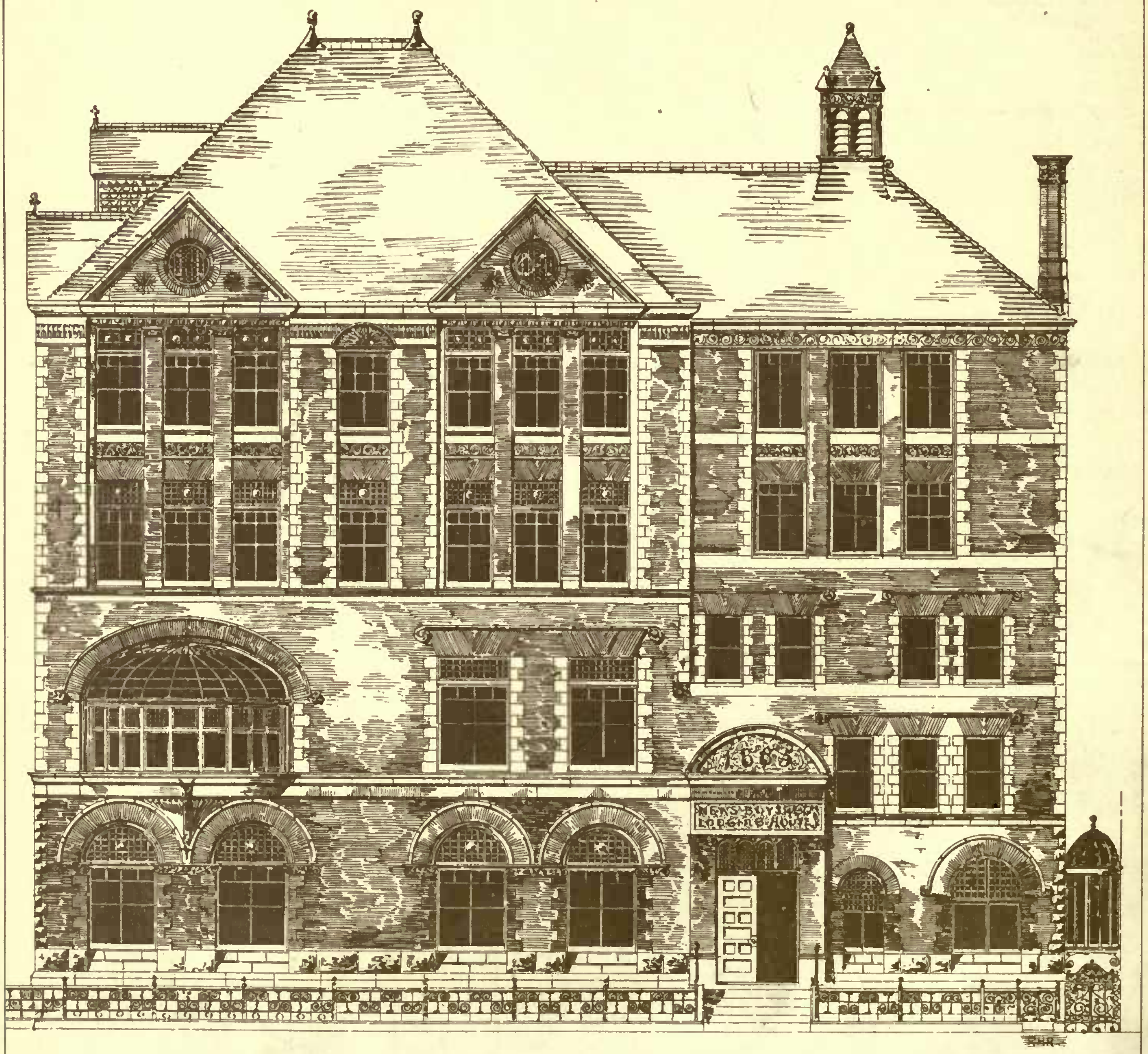
No. 503 American Architect and Building News, Aug. 15 1885



— Basement Plan —

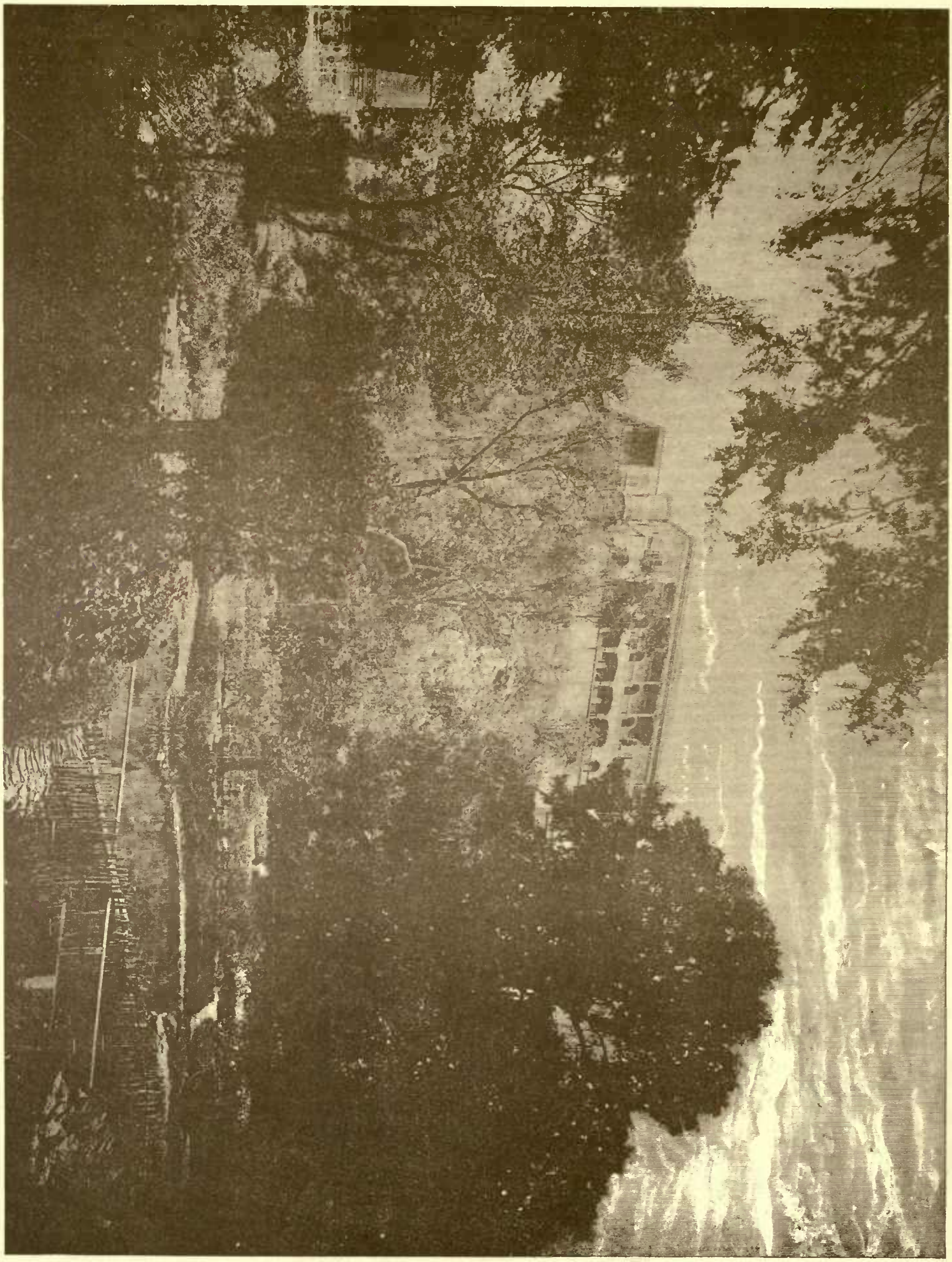


— First Story Plan —

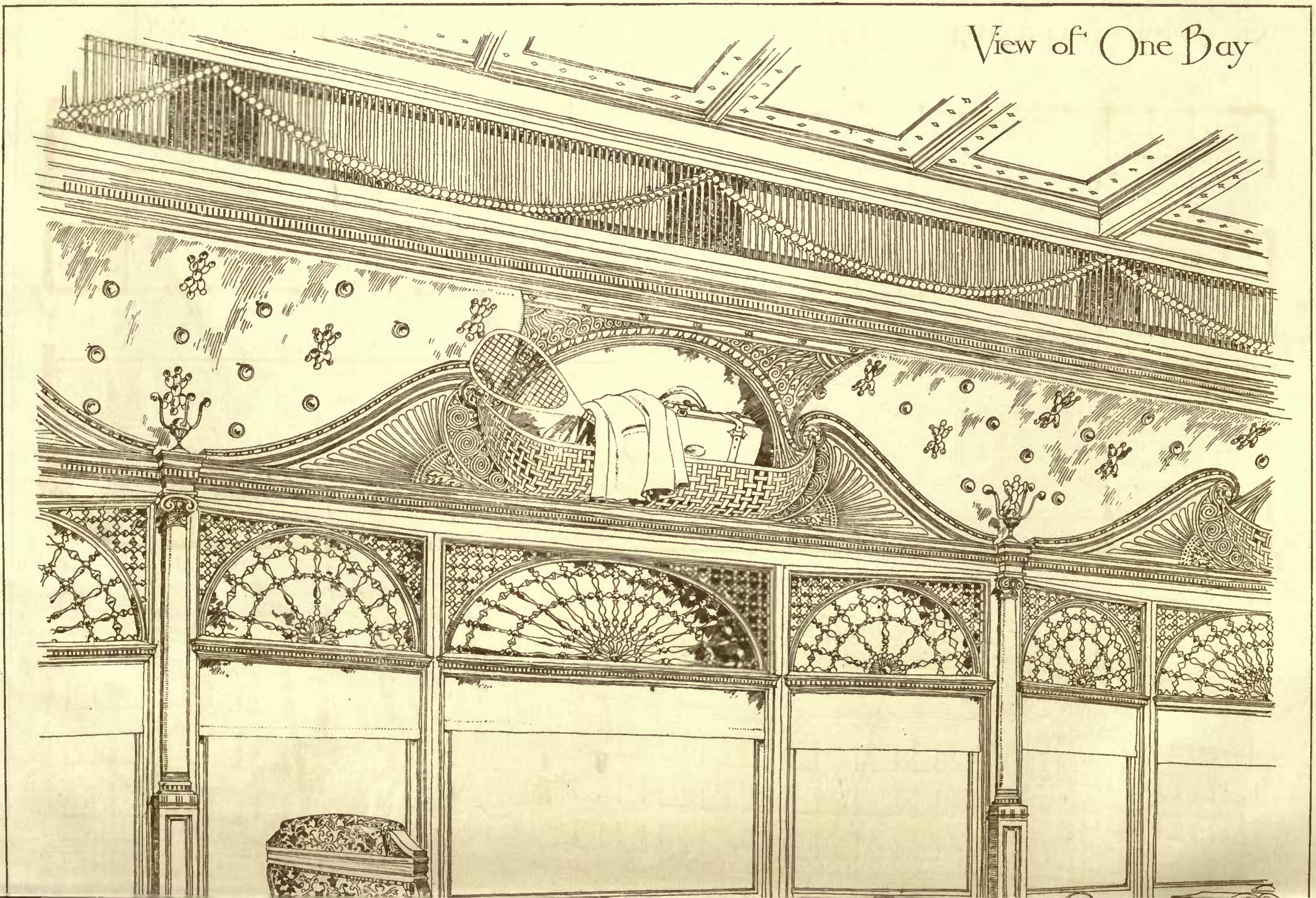


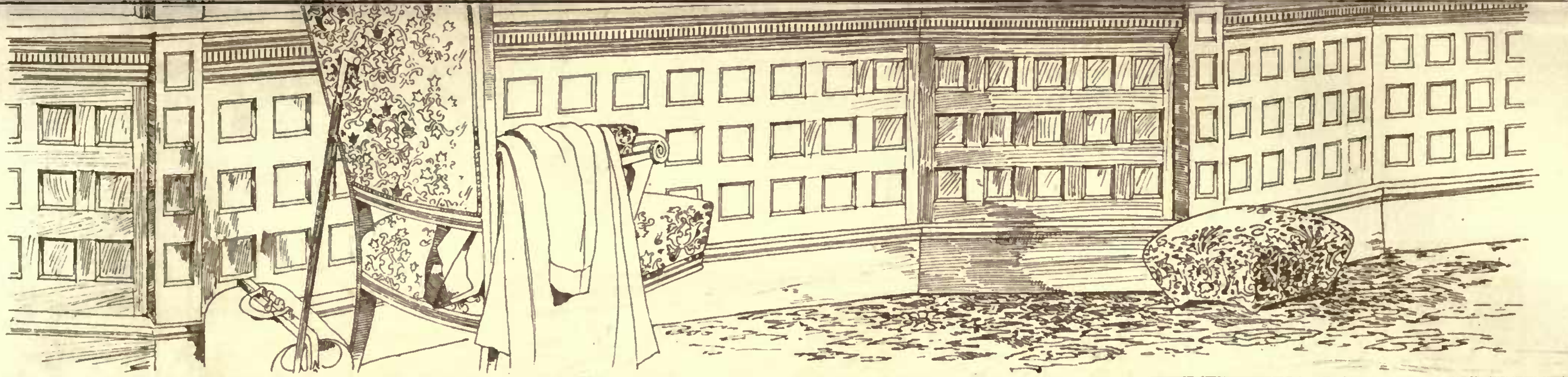
— Street Elevation —

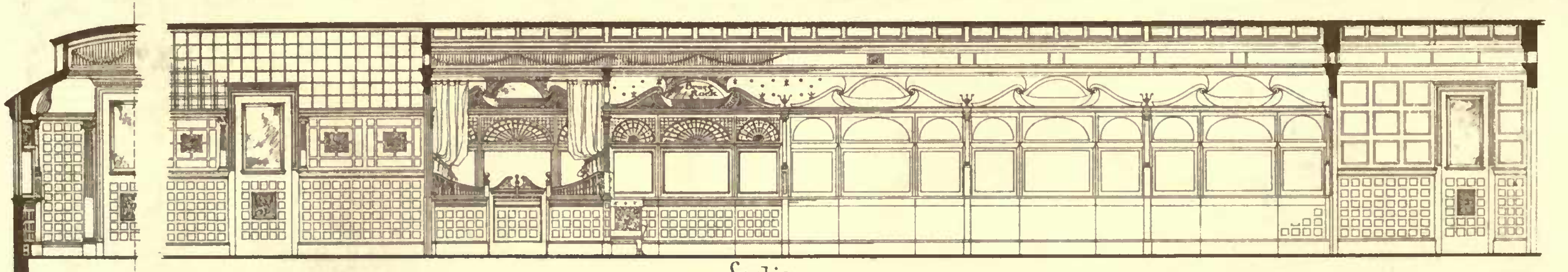
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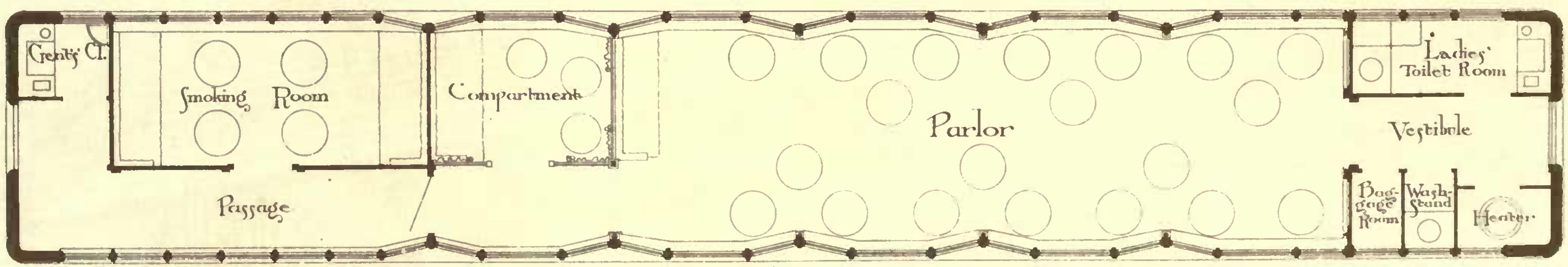
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View of One Bay





Section



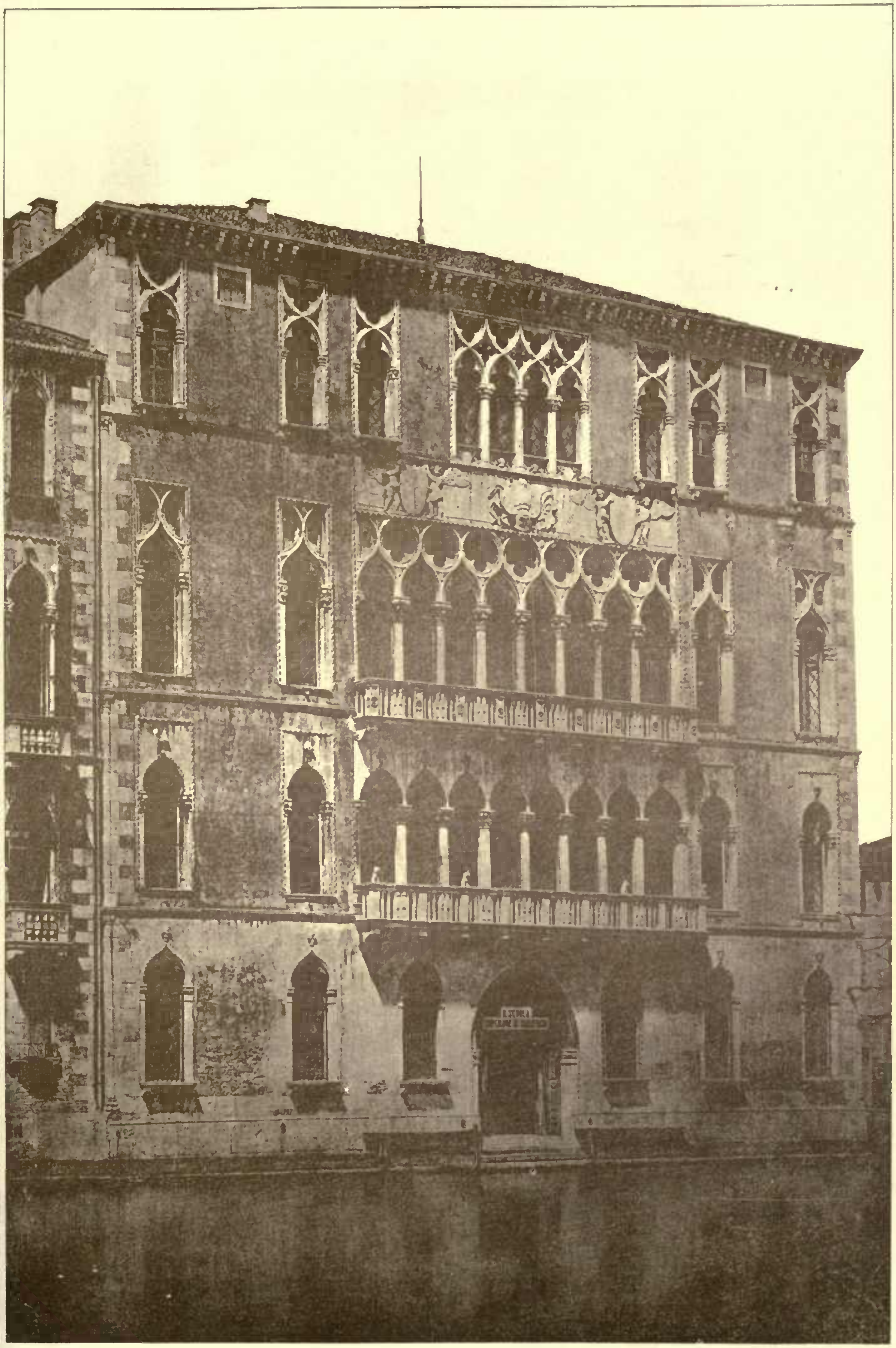
Plan

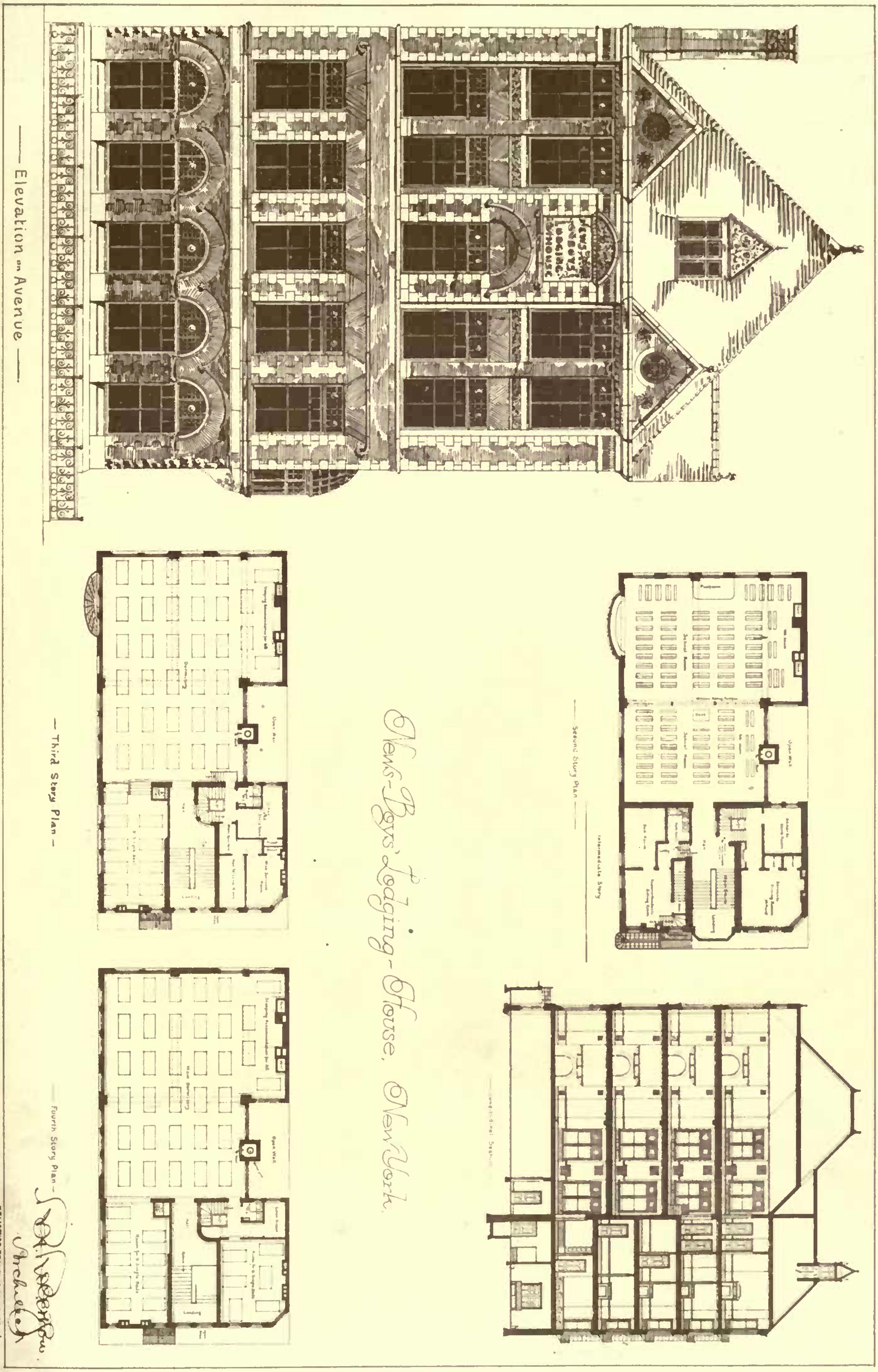
A Bay-Window Parlor Car, Penna. R. R. Co.

Bruce Price, Architect, N.Y.

D. A. Gregg del.

Heliotype Printing Co. Boston




Elevation on Avenue
Third Story Plan
Fourth Story Plan
Second Story Plan
Intermediate Story
News-Boys' Lodging-House, New York.
HELIOTYPE PRINTING CO. BOSTON

four young men, "pensioners" the French call them — that is, students who, having won the Grand Prize, were to be supported as students at the Academy in Rome — who were to become the leaders in the new architectural movement. They were Duban, Duc, Vaudoyer, and Henri Labrouste, who was presently followed by his brother Théodore. At this time the revived study of Greek architecture was in full course. Hittorff was in the midst of those studies of the Greek temples in Sicily which more than anything else gave stimulus and direction to the Neo-Grec movement. These four returned to France to become the evangelists of its gospel.

The earliest conspicuous instance of their work is the column of July, built on the site of the old Bastille, by M. Duc. It is a quasi-Corinthian column of bronze, more Greek than Roman in the character of its detail, but differing widely from any received or traditional form, being less than eight diameters high, with a banded shaft, and raised on a tall pedestal. Mr. Fergusson says of it that "of all modern columnar monuments, it is certainly the most successful," and he adds the criticism that "the abacus of the capital ought to have been circular." "The angular forms of the Corinthian capital," he says, "inevitably suggest an entablature, and of all things such a suggestion is the last wanted here." Nevertheless the tholus and the winged figure which surmount it are an agreeable termination, and it is exactly the horns of the Corinthian abacus that here relieve the junction of the shaft with its superstructure from tameness — tameness that amounts to insipidity in most monuments where a single round shaft is crowned with a round abacus. The bands that surround it are worth noting as a reminiscence of an invention of Philibert de l'Orme, who invented them for his work on the Tuileries, as a reasonable treatment of a column too large to be monolithic, from whom they were copied till they were very characteristic of the architecture of his time, and who gave them the name of *colonnes Françaises.*

The typical examples of the so-called Neo-Grec style are the public buildings or *palais*, built during the latter part of the reign of Louis Phillippe and the first days of the Empire. The Palais des Beaux-Arts, built by Duban, is a well-known example, and has a façade noticeable for its elegant repose and the quiet refinement of its detail. The Library of Ste. Geneviève, built by Henri Labrouste, between 1843 and 1849, is a more masterly adaptation of classical detail in a straightforward way to a distinct and visible modern use. It is a simple rectangle of two hundred and sixty-three by seventy-five feet, unbroken except by a projection for a staircase in the rear. It consists of a simple basement divided into the rooms needed for the purposes of the library, and a second story which is one continuous hall. It was a great step in advance, being perhaps the first building of mark in which modern invention boldly expressed its processes with a masterly control of classical detail. The exterior simply expresses the character of the interior. The basement is vigorously plain, with round-arched windows bare of decoration, divided by a strongly-marked belt from the second story. The characteristic feature of this story is a series of bays or windows, divided only by pilasters or piers, and reaching with their archivolts to the tænia at the bottom of the frieze. The flat archivolts rest on an enriched impost or cap, which extends into a string-course where it crosses the wide piers at the angles, and on each corner above the impost a small pilaster or flat colonnette continues to the frieze the slight support which this seems to receive from touching the top of the archivolts. This feature is clearly borrowed from the eleventh and twelfth century architecture of the middle and south of France. It is an early instance of the cleverness with which the more classical French architects appropriated whatever suited them from the spoils of the mediævalists and of their preference for the Romanesque rather than the Gothic contributions. Only the upper third of the windows or bays are glazed; the lower part being filled with screens, which are divided by decorated bands and vertical mouldings into panels filled with inscriptions. This, I believe, is the first introduction of a feature that has since found many uses. The upper glazed parts of the windows give abundant light for the interior, and the screens below give as high wall-space as is desirable for bookcases. The whole arrangement is as admirable and expressive as it is ingenious. It appears from the drawing that I have at hand that the lighter string-course which marks the window-sills is broken around the pilasters so as to form bases, but unsupported by any block or die extending to the belt below. Under this belt-course is hung a continuous series of the heavy, classical garlands which seem to commend themselves to the French as monumental. The frieze above the upper windows is enriched with Greek motives, and carries a cornice elegantly profiled, and treated with classic feeling but with great freedom; the hollow bed-mould being so expanded as to give at a distance the impression of a concave corona, and the cornice, instead of a cymatium, carries a vertical *cheneau* or gutter enriched in very free imitation of the upright gutters found among Grecian ruins, not so much in Greece itself as in the Grecian remains in Sicily and the colonies. The plain roof is framed in iron, the truss-work boldly shown on the inside, and decoratively treated: another instance of the stimulus to independence and invention which the activity of the time furnished.

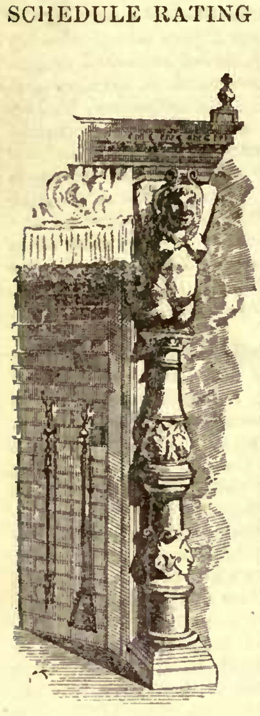
The Conservatoire des Arts et Métiers, by MM. Vaudoyer, father and son, is another conspicuous example of the new style, of which I will not undertake a detailed description. The additions to the Palais de Justice made by M. Duc are perhaps the most highly praised examples of the style; the famous Salle des Pas perdus, which is the long waiting-gallery or continuous vestibule connecting the rooms of the various courts, and the western façade which won for M. Duc the *Prix Extraordinaire* of one hundred thousand francs, given by the Emperor for the greatest achievement in architecture. Of this work of Duc's his noted mediævalist contemporary, Viollet-le-Duc says: "We may cite, among others, one of the most remarkable [works of architecture at Paris], the new part of the Palais de Justice, wherein the decoration belongs to the structure, sustains it even, and by virtue of this fails neither in grandeur nor in originality. The Salle des Pas Perdus, without and within, is one of the monuments which will do honor to our time. In it everything holds together, is made one by clearness of idea. The execution, as always happens, answers to the composition; it is fine and pure. We feel the artist — a rare thing in our day — who respects his art and the public."

But the lavish expenditure of the second empire, the enormous reconstructions undertaken in Paris and the other principal towns of France, gave such an impulse to building, and called for such an amount of designing, that it would have been impossible to keep it in the hands of the small class of trained men, "pensioners" from Rome, who had done the principal work at the end of the preceding reign. A great many more architects were called into activity, and the taste of the day tempted them to greater freedom and exuberance of treatment. The influence of the Ecole des Beaux-Arts was still a restraint, and academic symmetry and balance of ensemble have never been generally thrown off. But while the men educated at Rome by the Government have furnished an official class of architects to whom most of the important works are due, and who have been distinctly marked off from the rest of their profession, a few others have by merit or favor been brought to the front, have done conspicuous work, and left their mark upon French style. Among these are all or nearly all the mediævalists. One of the most conspicuous and influential undertakings of the Emperor was the extension of the Louvre toward the Tuileries, and the uniting of the two. This is so well known, and has been so often and so clearly described, that a slight mention of it is enough.

It should be noted that Visconti, the architect to whom it was first intrusted, was Italian born, and at least as much Italian as French in education and feeling. He had been known beforehand by the tomb of Napoleon in the Invalides, by the fountains of St. Sulpice and Molière, and a variety of other monuments, none of which show any sympathy with the new movement in France. He was a man of ready ideas, of many imposing and fairly original conceptions, whose means of architectural expression were Roman rather than Greek, and whose sympathies were rather with the Italian and earlier French Renaissance than with the modern movement. He cared nothing for the secrets of construction, and accommodated his design to them as little as was practicable. Though he did not live to carry his buildings much above the ground, and though his designs were afterwards somewhat modified in detail by his successor, Lefuel, yet they unquestionably took their character chiefly from him. Whether it were out of deference to the designs of Visconti, or from his own similar feeling, Lefuel does not seem in the buildings of the Place Napoleon III to have been much influenced by the Greek tendencies of his fellows. The wings and pavilions up to the cornices are almost as much Italian as French; the characteristic roofs of the pavilions are those of the Tuileries to all intents and purposes, and in the dormer windows that spring from them the work of the decorator is often more visible than that of the architect. The ornamentation, nevertheless, has an elegance and refinement which is not like any equally exuberant Italian work. The latest of his work, however, especially the new Pavillon de Flore, which is perhaps the most elegant, bears somewhat more trace of Neo-Grec influence, and although there is not much that is Greek in its detail, has a refinement and in most places a moderation in ornament, as well as certain peculiar dispositions of the subordinate forms, which show that the influence of his contemporaries was not lost on Lefuel. These façades have appeared to the world as the chief representatives of modern French architecture, and have been the types of most of the imitations of it outside of France, notably in the public buildings of our own country, and to a great degree in the provincial towns of France. Hence the characteristics of French architecture have been taken to be the Roman Orders, designed with an affectation of refinement in profile, straight and pedimental window-caps, with consoles of a somewhat Greek severity in line, frets and flowers, and above all steep roofs with hollow cornices at the top, and heavy, buttressed dormer windows at the bottom. Of the buildings which imitated the new Louvre, more or less, the Hôtel de Ville at Marseilles, the new Bourse at Lyons, and the Hôtel de Ville at Havre are good examples. The roofs of the old French châteaux, with their sharp pyramids and wedges, and their truncated masses, have given the salient character to the outlines of buildings in this style, and the *flèche* or belfry of the Hôtel de Ville has been the prototype of a thousand others more or less successful.

Of the private houses built in Paris during the empire there is not much occasion to speak. Most architects have seen them, and we are all familiar with many imitations of them. It is enough to say that the French architects had been quietly developing their form during all the last generation, and that in spite of the excessive and somewhat lawless elaboration of the second empire, they offer the most distinctive and reasonable type which has been invented of late for the houses of a large city. L.

SCHEDULE RATING THE SUREST MEANS OF CHECKING FIRES.



IT gives us unusual pleasure to reprint from the *Spectator* the following outspoken opinion on the duty of the underwriter in helping to correct the present building methods which forms the substance of an interesting paper on bureau inspection, read before the recent annual meeting of the South-eastern Tariff Association :

The signs of the times seem clearly to indicate that in the near future we must institute some radical reforms in the matter of conducting our business. Passing by even such grave questions as the mode of compensating agents, the manner of making adjustments, and other serious matters which are fruitful of evils in our business, because they are more difficult to handle, and there first must come a more general agreement among the companies as to what can be done before they can be dealt with, we come to a matter lying close at hand, which will ere long press itself upon our attention, and the sooner we deal with it the larger will be the benefit we can reap from it.

The day must already have been passed when a thinking underwriter can hold that it is our business merely to take risks as we find them, and have no part in securing a betterment of their various features. This idea has directly been the cause of rendering nugatory some of our best endeavors. All must now have come to see that our highest interests are best subserved by cultivating a sense of mutual interest or partnership with the public in lessening the fire-waste, which can only be done by improving the character of risks. The grave mistake which we make as an association has been in being blinded by the question of rates to other considerations almost as essential for securing profit from our business. When we organized, certainly the first thing to do was to lift our rates from the slough of despond into which they had fallen. But our error has been in not taking into consideration earlier other elements affecting the result of our business. We have lifted the rates, tentatively at first and then more boldly as we felt our power grow, but with what result? The loss ratio has increased more rapidly than our rates, and we actually find that we get worse results from our business with high rates than we did at the time when they had sunk so low that we could not excuse ourselves for accepting them, other than by admitting that our business had fallen into utter demoralization; and we have now gotten the rates to the highest limit that it would seem we can afford to charge. This seems clearly to show that we must look to other means than rates to remedy our trouble. One of the wisest things this association could do would be to establish schedule rating as the surest means of bettering our risks and checking the heavy fire-waste. But though we may not be prepared to take this step at present, we can do the thing now proposed if we are but willing to incur an expense which will make a hundred-fold return, and do much to lessen fires without disturbing rates in any considerable degree, or provoking hostile criticism from the public.

It behooves us to take heed of the lesson which the mutual companies are teaching us, and in a measurable way demand improvement of risks, or at least the abatement of serious dangers. We cannot shut our eyes to the fact that the mutual principle is gaining ground in this country, and threatens to make serious inroads into our business because we neglect to do in a thorough way what many of us undertake individually, but cannot compass alone. We will make a great mistake if we belittle the competition from mutual companies. In some parts of the country they have already grown strong because the stock insurance companies sought to ignore them, and they now threaten to extend their operations into fields which we have believed would be left entirely to us. It should be remembered that they take the very best risks, and therefore make it all the more difficult for us to obtain paying rates for those which are left to us. The characteristic feature of these companies, of which we could readily avail ourselves, is the thoroughness of their inspections, and our bonds are sufficiently cemented to enable us to adopt their methods in a considerable way. The inspections of individual companies must necessarily be inadequate, however thoroughly and conscientiously the work may be done by the representative of one company. The knowledge that even a reasonable demand will incur ill will for his company, both on the part of the public and agents, deters many an inspector from requiring a removal of defects which the other company (that terror which frightens the backbone out of so many) has passed unchallenged. Then, next door to "our risk" may lurk a danger which may carry down our risk in a common ruin, but has not been seen by our inspector, because he did not have an inspection slip for it. Then, too, when the inspector of an individual company finds a defect in a risk he cannot have it remedied because the assured can so readily go to another office and procure insurance without making the change insisted upon, and the policy of the company represented by such inspector is cancelled, and the risk is at once placed in another company. The defect remains to bring its doom, a fire results, and just so much property is destroyed. Whereas, if the inspector had represented all the companies on the risk, his demand would have been met, loss averted, waste of wealth prevented, and the community just so far benefited.

But we will not dwell upon the many reasons why inspections by individual companies must necessarily be inadequate, for they are too well known to you all. But when an inspector comes to a risk authorized to investigate it thoroughly by every company writing on it, and to require in their name the removal of defects or making of improvements, such recommendations cannot be disregarded.

It is therefore suggested that we organize within our association a bureau of inspection, to be operated on the following plan :

Let a competent judge of risks, who is also possessed of energy and earnestness of purpose, be appointed to take up systematically the inspection of every risk in the town or city he may visit. Let him be provided with credentials showing his authority to inspect for every one of our members, so that when he enters upon a premises the owner may know that every company whose policy he holds is represented by the inspector. Let a suitable blank be prepared, designed to exhibit the different features of a risk, and then let such inspector enter upon his work, which shall be to examine systematically every risk from cellar to top of roof, noting all the features, pointing out defects, and making suggestions.

To avoid the objection which a company may feel of having its business known by any save one who is in its employ exclusively, such inspector shall not know what companies are on the risk, nor shall he come in contact with the local agent so far as the discharge of his duties may be concerned. When his inspection of any place shall have been completed, he shall submit all of his reports to the secretary of the association, who shall duplicate them either by hectograph process or printing, as may be deemed best, and send one to each company represented in the place inspected. A company will then have before it a report on every risk in a town, and by consulting its maps, or other records, will ascertain what risks it is interested in, or what hazard it may be effected by outside its particular risks. It is plain to be seen how much more valuable such inspection will be than can possibly be the work of an inspector for a single company. As the inspector has represented no particular company, no one company can incur the ill will of the owner of the risk, who may have to be dealt with by demanding improvements in his risks, or cancellation of his policies. The individual judgment and discretion of a company will in nowise be affected, or its perfect freedom of action in any means be curtailed by this plan. The information regarding its risks will merely be placed before it, and it will remain to each one to act upon that information as it may deem best. In those cases where concurrence of action on the part of all companies on the risk may be desired, a request to the secretary would secure a bulletin to each company, who may act with the others at a time fixed if it so desires. How much can be accomplished by this plan in improving risks, avoiding losses on the part of our members, and saving the fire-waste to the public, suggests itself at once.

This much has been said concerning the physical hazard of risks, but I feel quite certain that an inspector operating in the manner proposed can do what would be impossible for a single company in developing the moral hazard of risks. This may at first appear to be chimerical, but I beg you to consider the matter before dismissing it as impracticable.

Consider, for instance, the effect of this course: An inspector acting for all companies could make such minute examination of risks as, if attempted by the representative of one company, would be denied by the owner, and merely result in the cancellation of such company's policy. But the association inspector could examine a risk from cellar to garret, look under counters, into drawers, boxes, etc., and readily arrive at a fairly accurate estimation of the value of the stock. Then, he could interrogate the assured, and find out how nearly his representations conform to ascertained facts by making him declare his estimation of the amount of stock on hand, make him exhibit his last two inventories, and examine such to satisfy himself as to the points naturally arising in regard to them. Then, too, the inspector could procure from the tax-books the returns of the assured, and consult Dunn and Bradstreet and other commercial agencies as to the standing and condition of the assured. Then, when all this information is summed up and exhibited to a company in a blank, separate from that already alluded to, I believe in many instances a lurking moral hazard would be discovered which would otherwise never be known or even suspected till after a fire.

Considerable time would be required to do this work in the manner proposed, but the expense would be light when divided among all the companies, and those of us who keep statistics showing the results of inspections must be prepared to believe that the return for such expense would be very great, and probably made up by the saving of a single loss in the State. The expense could be apportioned among the companies doing business in the different towns or cities according to the amount of business done, which information can be obtained from the local boards.

It would be well, no doubt, to start the plan with only one inspector; and if results are satisfactory, others could be appointed, and the plan extended as the members might deem advisable.

BITUMINOUS COAL.

BOSTON MANUFACTURERS' MUTUAL FIRE INSURANCE COMPANY,
BOSTON, MASS., May 20, 1885.



Lion's Head from the Parthenon, Greece.

FOR many years this Company has assented to the guarded use and storage of bituminous coal from the George's Creek Valley in Maryland, in buildings insured by this Company, and as yet no loss has occurred from this kind of coal taking fire spontaneously.

During the progress of the recent investigation of the subject of spontaneous combustion in bituminous coal, a fire happened to occur from this cause in a pile of coal which was not insured, but which was in the yard of one of our members, in coal which was supposed by the agents who sold it to the corporation to have been mined in the George's Creek Valley.

We, however, ascertained that the shippers of this coal also dealt largely in coal from other sections, some of poor repute as to the risk of fire; and we are fairly satisfied that the coal which ignited was not from the George's Creek Valley.

At the request of some of our members, our Inspector Woodbury has been instructed to visit the Cumberland coal region, and to report upon the coals of the George's Creek Valley. His report is as follows: —

BOSTON, May 7, 1885.

EDWARD ATKINSON, ESQ., *President*: —

Sir, — In regard to the matter of the George's Creek coal, I would report, that the valley of the George's Creek lies to the west of Cumberland, Maryland, and contains several veins of coal, only one of which is mined at present, which lie in nearly a horizontal direction, and the outcrop occurs on the slopes of the hills enclosing the valley. The "big vein" has a total thickness of fourteen feet, the upper and lower portions being mixed with strata of slate, leaving eight to nine feet of pure coal in the middle. All the companies except one (the Consolidation) confine their mining to this central portion of the vein.

I went into portions of a mine which had not been worked for about twenty years, and could not find any evidence of crumbling or decrepitation of the coal, as would be the case if there had been any appreciable deposit of iron pyrites in the coal to cause chemical action by its dissociation.

In one place I saw a railroad embankment made of coal which had been struck in a cutting and piled up for about three years. The fact that coal fires are unknown among consumers in this vicinity is no evidence in itself, because the coal is so near to the consumers that it is never necessary to store it in large quantities for a long time. At Pittsburgh I was unable to learn of the spontaneous ignition of any coal, although the same varieties of coal frequently ignite after being stored in the Eastern States.

I did not find any lumps of iron pyrites in the mines visited, although I made especial search both in the mines and around the entrances. I asked one of the miners where I could get a specimen, and he replied that he had never seen any in the middle stratum of the vein, but had seen some which had been taken from the lower portion of the vein, which was not worked in that mine.

The following companies are mining the "big vein" in the George's Creek Valley: Borden Mining Co., Consolidation Coal Co., Blaen Avon Coal Co., National Coal Co., George's Creek Coal and Iron Co., New Central Coal Co., Swanton Mining Co., Potomac Coal Co., Maryland Coal Co., Maryland Union Coal Co., American Coal Co.

There are other mines which are practically exhausted, and it has been alleged to me that coals from other districts are sold under the names of such mines, which are controlled by the same parties. Also it is known that mines and shipping points in different mining districts have names which are either identical, or with a different spelling have a similar pronunciation.

It is not possible to identify a coal, except so far as reliable evidence can be furnished by the shipper. There have been two instances of spontaneous ignition of coal alleged to be George's Creek; but in each case it was sold by a firm also acting as agent for West Virginia coals. I cannot learn of any instance of George's Creek coal igniting spontaneously.

I believe that more coal is sold under the name of George's Creek than the production of the mines will warrant, but there are no means of identifying the product of any mine. All bituminous coal contains sulphur, and, although the proportion shown by the analysis of George's Creek coal is very small, there does not seem to be enough difference in the amount as compared with that from other regions to account for the admitted difference in matters of spontaneous ignition, and the appearance of the coal mines at George's Creek confirms my hypothesis that in this coal the trace of sulphur in the form of iron pyrites is so uniformly disseminated that there is no concentrated chemical action increasing the temperature to a dangerous extent.

I have recently learned that one of the members of this Company is now using Maryland Company's George's Creek coal which has been stored in the mill-yard in a pile over twelve feet deep for four years.

Respectfully submitted,

C. J. H. WOODBURY.

Since there is no way in which the coal itself, from this section, can be identified, it will be apparent that the security of our members and our own immunity from the danger of loss will rest mainly on the character of the agents or dealers from whom they make their purchases. It must also be remembered that this Company does not assure members that even George's Creek coal will not take fire; all that we can do is to take the risk upon it with greater confidence than upon some other varieties.

There is a great difference in the reputation of other bituminous coals, and it is not intended to create an absolute preference in this case. If any members are desirous to have us continue this investigation by an inspection of other mines or other sections, their wishes will be met to the best of our ability.

Respectfully submitted,

EDWARD ATKINSON, *President.*

COPPER *vs.* GALVANIZED-IRON.

JACKSONVILLE, ILL.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sir, — Will you be kind enough to state which material, copper or galvanized-iron, is the better for use in a position constantly exposed to the action of steam and the gases contained in coal smoke? The only question is the liability of rust or corrosion.

Yours truly, DANIEL E. PIERSON.

[COPPER is very much to be preferred. — EDS. AMERICAN ARCHITECT.]

THE TORONTO COURT-HOUSE COMPETITION.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — It may be interesting to the profession at large, and instructive to its younger members, to learn the apparent outcome of the competition for the Toronto City Courts; a competition whose requirements and conditions were of the most unobjectionable nature, which promised a committee of experts as judges, which divided $1,000 in premiums, which promised most fair and equable treatment, but which, alas! has sadly fallen from the gracefulness of its promise.

By the terms of its conditions, drawings were to be received not later than April 23. The enclosed clipping from a Toronto paper under date May 22, shows what has been done since that time.

THE COURT-HOUSE PLANS.

"The court-house committee met yesterday afternoon, Chairman Hastings, Ald. Crocker, Carlyle, Jones, Gormley, Pepler, and John Woods being present. The reports of the experts, Mayor Manning, Matthew Shread and Thos. Fuller (Ottawa) was read:

'In pursuance with your request of the 14th inst., accompanied with printed copies of the instructions issued for the guidance of architects, and also of a circular addressed to architects dated March 4, 1885, from the city clerk's office, we at once commenced the inspection of the various set of and plans specifications, fifty in number, submitted for our consideration and adjudication.

'Clause No. 3 of the circular March 4 is "that no prize be awarded to any plan, the carrying out of which will exceed $200,000." After several very careful examinations of the designs we have to report that the greater proportion were found to be so defective in general arrangement and deficient in light, etc., and so unsuitable in exterior and interior designs as not to be worthy of further consideration. Of the balance, though many exhibited much thought and skill in the arrangement of the various courts and offices, and as regards the exterior, were evidences of considerable artistic skill, yet there were serious objections to the grouping of some of the departments for the transaction of business and for obtaining light and air, two very important features. As there was not one suitable design, the carrying out of which would not greatly exceed $200,000, we are prevented by clause No. 3 from making any award of the premiums; and we further found that under any circumstances there was not one design which we could recommend for adoption in its entirety.

'The competitors have no doubt expended a vast amount of time and money in the preparation of their plans, but with such a definite condition as that of clause No. 3 in the circular, they have done so at their own risk. It may be said that some plans have been accompanied by detailed estimates, and even in one case by a tender (not asked for), but the prices on which these estimates were made vary so greatly that it is evident that no reliance can be placed on them, and they are, in our opinion, prices at which work could not be properly and honestly performed. For the above reason we are not able to recommend any design for erection or to award the premiums to any.

'It is evident to us that the sum named as the limit of expenditure is not sufficient to provide a building of the character and finish appropriate for a public building of this class and therefore if the requirements, as called for in the printed instructions, are to be strictly adhered to, it will be necessary, judging from the plans submitted, to largely increase the appropriation, or otherwise the required accommodation must be modified.

'As we cannot advise the adoption of any design in its entirety, and as by clause 3 we are unable to award any premiums, we consider that all plans and specifications should at once be returned to the various authors without being made public, and as the authors of the following (the experts here gave the names of seven mottoes, but the committee deemed it advisable not to make them public at present) have irrespective of cost, as regards the arrangements most closely adhered to the requirements, and whose elevations are of the most appropriate character, we recommend they be invited to prepare amended designs to be submitted, say four weeks from date of invite, on the following conditions;

'Plans drawn to a scale of an eighth of an inch to a foot, to consist of the following: Four elevations: two sections; plans of each floor; plan of roof: perspective at option of competitor; also a brief description of the various materials proposed for the construction. The system to be adopted for heating and ventilation should be subject to future consideration; therefore it is only necessary that competitors should allow in their estimates the sum of $10,000 for that purpose. Each architect to be paid $250 for his design, provided the plans submitted are appropriate for such a public building, and that the cost of erection will not exceed the amount stipulated.

'That the author of the plan approved for erection shall be employed at the usual professional remuneration of five per cent.

'If this recommendation is adopted it would be manifestly unfair to the competitors that the present plans should be made public; hence the recommendation that they be at once returned to their respective authors.'

"The feeling among the members was that a large additional grant would have to be made in order to meet the expense of a building alike suitable and creditable to the dignity of the city. They

recommended the adoption of the report. When the report came before the executive half an hour later, Ald. Walker thought the court-house committee had passed it too hastily, and moved that it be referred back, which was carried."

The committee of experts meet upon the 16th of May and report upon the 21st, a Sunday intervening.

In this short time they assure themselves that no design can be executed for the amount of their appropriation, all other estimates and even tenders to the contrary, notwithstanding, and throw everything over.

From that time to this absolutely no steps have been taken, as the accompanying letters set forth. In effect, for the space of nearly three and one-half months nothing has been done, nor does it seem likely, from such brilliant beginning, that anything will follow except an overpowering desire upon the part of the competitors to consider themselves most unfairly and unjustly treated. This is perhaps putting it mildly. The profession has another experience, and the committee fifty sets of drawings.

These, if useful in no other way, may, with their accompanying specifications, be sold as old paper. The receipts from this source, together with the saving incidental to the use of the stretchers as kindling-wood, almost reimburse the State for the expense of advertising, printing, stationery and postage. I am sure the competitors would subscribe to make up any deficit.

I have the misfortune to be, "A Competitor."

NOTES AND CLIPPINGS.

Artificial Earthquakes. — Professor Milne, of Japan, has been making further and very original experiments in that country, in order to study the effects of earthquake wave-movement in different soils. As he could not command earthquakes to come at his bidding, even in that earthquake-favored land, he endeavored to produce them artificially. This he did by subterranean explosions of dynamite, and by causing heavy weights to fall from a great height. The results recorded are most interesting, but far too complex in their nature to be detailed here. It is illustrative of the enlightenment of the Japanese administration that such startling experiments were not only permitted but encouraged. — *Chambers's Journal.*

Red Oak for Inside Finish. — A singular feature of the hard-wood trade is the prejudice that exists in certain localities against red oak as a finishing wood. This prejudice seems to be strongest in New England, and the reason assigned for it by the dealers is that it will not admit of a first-class finish because the pores of the wood absorb the filling to such an extent that a rough surface is left, which cannot be polished down. If this is the only objection which can be urged against this beautiful wood the parties who condemn it must be ignorant of the practical facts in the case. Throughout the West red oak is in favor for interior finishing and furniture uses. Western cabinet-makers and hard-wood finishers have no trouble whatever in giving it as fine a surface as can be found upon the majority of woods used for such purposes. If properly sawed it develops a beautiful, diversified grain, the appearance of which is fully as striking and effective as any of the other light-colored woods. It is next to impossible, however, to sell a car-load of it in New England, and particularly in Boston. It is more than probable that prejudice and ignorance have more to do with keeping it out of those localities than any inherent defect in the wood itself. — *Northwestern Lumberman.*

Warehouses found at Rome. — An interesting discovery illustrating the commerce and the luxury of ancient Rome has been made close to Monte Testaccio and the English cemetery. The whole of that district to the west of the Aventine outside the Porta Tregemina was occupied by granaries and warehouses for the storage of imports of all kinds. Between the northern side of Monte Testaccio and the Tiber there still exist colossal remains of the great emporium built by Marcus Emillius Lepidus and Emillius Paulus nearly 200 years before the Christian era. In the year 1868 a considerable portion of the quays was discovered together with some six hundred blocks, many of them of large size, of rare, variegated marbles of all kinds, lying just where they were landed from the galleys which had brought them from Numidia, the Grecian Islands, and Asia Minor fifteen centuries ago. Now, in the course of the building operations in this locality, two warehouses have been discovered, one filled with elephants' tusks and the other with lentils. It is curious to find such products stored side by side, but as bags of lentils were sometimes shipped as ballast they may have served that purpose. The discovery would have been a very valuable one if, unfortunately, the ivory had not been much decayed. The *Popolo Romano* states that it is the intention of the Syndic to remove the bronze equestrian statue of Marcus Aurelius from the piazza of the Capitol to a museum, and to erect a bronze reproduction in its place. The reason for this change is scarcely apparent. The statute certainly does not occupy its original position, but, to employ Michael Angelo's opinion of it, it is a "living monument of ancient Rome." It has stood in the sight of the people — one might almost say of the world — for more than 1,700 years; and although the gilding has nearly disappeared it has in other respects suffered no injury during this lapse of years. It endured much rough handling in the course of removal, and when wine was made to flow from the nostrils of the horse in the time of Rienzi. Standing where it does it forms an integral part of the ancient magnificence of the city, and affords a vivid illustration of its splendor; but removed to a museum it will simply be part of a collection of works of art.— *London Times.*

Mr. Ruskin's Successor. — Mr. Herkomer has been elected Slade Professor of Fine Arts at Oxford University. He succeeds Mr. Ruskin.

Fate of One of the Makers of New Paris. — Stories sometimes come to light which are even stranger than the disclosures of our own police courts. A man has just died of starvation at Montrouge, after a strange reverse of fortune. He was known in the humble society among which he ended his days as Le Père Fallais, but under the Empire, less than twenty years ago, he lived in great luxury. He was the contractor who undertook the work for opening the Boulevard St. Michel, and in which millions passed through his hands. He afterward became utterly ruined in unfortunate speculations and lived for a time on the charity of an old beggar woman whom he had promised to remunerate when he came into a fortune he expected, but as the fortune did not come she lost patience and turned him on the streets. He was found lying on a heap of rubbish one night last week, insensible from exhaustion, and was removed to a hospital, but died the next morning. He had eaten no food for three days.—*Pall Mall Gazette.*

The Dutch National Museum.—The splendid new National Museum of Fine Arts, in which many of the most precious art treasures of the Netherlands have found a permanent and worthy home, was inaugurated to-day with a very imposing ceremony. The building, a magnificent structure in Dutch Renaissance, erected by the celebrated architect, M. P. J. H. Cuypers, was commenced in 1876, and has cost, from first to last, no less than two million guilders. At the time of the International Colonial Exhibition in 1883, the chief entrance to which was through the principal front of the new Museum, the latter was so far advanced that the collections lent by the Prince of Wales and the South Kensington Museum were placed in one of its principal saloons. Much, however, still remained to be done, and now the whole is complete it may safely be said that the Dutch National Museum, with its precious contents, is one of the finest and most valuable institutions of the kind in Europe.

Within the walls of the new Museum are united many fine collections, hitherto scattered in various spots. Among them are included the renowned galleries of the Hôtel de Ville of Amsterdam, the Museum Van der Hoop, the Haarlem Pavillion, the Netherlands Museum at The Hague, and the Royal Cabinet of Drawing. Many of the masterpieces of Rembrandt and the Flemish school are among the collection. The Museum, however, is not intended simply as a gallery of paintings and sculpture. It is to embrace a school of the industrial arts and of drawing, these latter departments being under the management of the talented Director, M. Obreen. In short, the National Museum will be at once the National Gallery and the South Kensington of the Netherlands. — *Correspondent of the London Standard.*

The Pantheon, Paris. — The Panthéon was begun in 1758, under the direction of the architect Sufflot. The edifice was destined in the beginning to replace the old Church of Ste. Geneviève, which threatened to fall from decay. In 1764 Louis XV laid the first stone of the dome, a bold creation to which Sufflot owes his celebrity. The work dragged, however, owing to repeated obstacles, and when the Revolution broke out in 1789 it was still unfinished. The edifice, therefore, was not consecrated to Catholic worship when the Constituent Assembly devoted it to the burial of illustrious dead, placing on it the following inscription: "*Aux grands hommes la Patrie reconnoissante.*" Besides Mirabeau and Marat, Voltaire and Rousseau, the honors of the Panthéon were accorded during the Revolution to Lepelletier of St. Fargeau, and Barra and Viala. In place of the shining cross, cut by Conston, Moitte represented on the *fronton* the figure of La Patrie or Country distributing her rewards, a design that inspired David in the group of illustrious men who adorn the tympanum. Other sculptured groups were placed beneath the vestibule. A statue of Fame was to surmount the cupola. For that it was necessary to change the summit of the lantern. The traces of the work, begun for this purpose, but never finished, are yet seen. Napoleon, after having the body of Marshal Lannes placed in the Panthéon, again become the Church of Ste. Geneviève, ordered this church to be used for the burial of senators and other dignitaries. After the Restoration the remains of Voltaire and Rousseau were removed by night from the edifice and thrown into a hole near the Bièvre. Moitte's *fronton* and the group of republican bas-reliefs were also removed, and lay for a long time in a shed in a yard of the College of Henri IV. These acts of iconoclasm were palliated by the representation of the apotheosis of Ste. Geneviève by the painter Gros, under the vault of the second cupola. The resolution of July reviving the law of 1791 restored the Panthéon to the destination intended by the Constituent Assembly, and replaced on it the original dedication. But no great men were buried within it. The magnificent *fronton* of David alone recalls the memory of that restoration, for the bronze tablets whereon the names of the citizens killed during the Days of July, 1830, were engraved have disappeared. The Government of King Louis Philippe caused the group and bas-reliefs of the Revolution to be replaced, and added thereto a group representing Ste. Geneviève arresting Attila, by Maindron. The Republic of 1848 made no change in the Panthéon. The celebrated physician, M. Foucaux, arranged in the middle of the edifice an apparatus that visibly demonstrated the movement of the earth's rotation. In December, 1851, a decree, signed by Fortoul, reaffirmed the royal order of 1830, that is, took away the Panthéon from the great men and restored it a second time to Catholic worship. A community of chaplains with a dean was shortly afterwards appointed for service therein. It is this decree of 1851, which was still in vigor, that President Grévy has abolished to return to the condition of things existing under Louis Philippe. The Panthéon — as it is popularly known — is built in the form of a Greek cross and is 369 feet long and 276 feet broad. The dome is 272 feet high and is crowned by a lantern. The summit of the lantern is 390 feet above the level of the Seine and about 470 feet above the level of the sea. — *Boston Transcript.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

322,906. BEVEL AND MITER. — Samuel S. Colt, Orange, N. J.

322,917. ROOFING-TILE.—John E. Donaldson, Montezuma, Ind.

322,935. PLANING-MACHINE.—Henry A. Holt, Wilton, N. H.

322,944. DOOR-BOLT. — Ralph G. Leininger, Philadelphia, Pa.

322,957. HYDRAULIC-RAM ELEVATOR. — Joseph Moore, San Francisco, Cal.

322,961. SEWER-GAS CHECK FOR SINKS. — James Neale, Bridgeport, Conn.

322,790. ASPHALTIC TILING AND PAVING MATERIAL.—Judson Rice and Andrew Steiger, San José, and Isaac L. Thurber, Santa Cruz, Cal

322,990. ROOFING-PLATE. — Josef Sporny and Ian Zarski, Warsaw, Russia.

323,009. BEVEL-PROTRACTOR. — Thomas B. Williams, Orange, Mass.

323,017. PIPE AND MONKEY WRENCH. — George S. Armstrong, Denver, Col.

323,018. HINGE.—Sullivan H. Atkins, Lynn, Mass.

323,020. SASH-FASTENER. — John Y. Bessell, Cincinnati, O.

323,030. PORTABLE HOUSE.— William Elford, Oakland, Cal.

323,063. LATCH.—Milton C. Niles, Oak Park, Ill.

323,077. BEVEL. — George W. Rice, Manistique, Mich.

323,083. BRICK-MACHINE. — William H. Stewart, Boonville, Mo.

323,092. FIRE-ESCAPE.—Leopold Werner, Newark, N. J.

323,110. CORNICE AND CEILING DECORATIONS. — August Carlewitz, Newark, N. J.

323,128. METHOD OF AND COMPOUND FOR PRESERVING STONE.—Thomas Egleston, New York, N.Y.

323,140. FIRE-ESCAPE. — Henry Gollings, Beltzhoover, Pa.

323,152. PAINTERS' SCAFFOLD.—William T. Howes, White Heath, Ill.

323,160. AUTOMATIC FIRE-EXTINGUISHER AND ALARM.—Geo. W. Landon, Baltimore, Md.

323,165. DEVICE FOR OPENING DOORS.—Samuel H. Law, Brooklyn, N. Y.

323,191. WINDOW-MIRROR. — Siegfried L. F. Melohn, Milwaukee, Wis.

323,198. BIT-STOCK.—George H. Packwood, Tampa, Fla.

323,209. COMBINED RADIATOR AND HEATING-OVEN.—Louis C. Rodier, Detroit, Mich.

323,218. PLOTTING-SCALE. — Frederick E. Shaw, Valley Falls, R. I.

323,229. MACHINE FOR SAWING SPOUTS. — Charles M. Strobridge and William Houghton, Merrill, Wis.

323,232. SHUTTER-FASTENER.—George J. Thomas, Newton, Mass.

323,235. HOT-WATER OR STEAM-RADIATOR.—Samuel D. Tompkins, Jersey City, N. J., and John N. Matlock, Brooklyn, N. Y.

323,288. FIRE-ESCAPE.—Mary A. Arrowsmith, Freehold, N. J.

323,300. VENTILATOR.—Vesper Dorneck, Indianapolis, Ind.

323,308. DOOR-OPENER. — Julius Finck, San Francisco, Cal.

323,338. WINDOW-AWNING.—William Jolliffe, Baltimore, Md.

323,348. BRICK-PRESS.—Hiram Lupher, Tullahoma, Tenn.

323,365. PROCESS OF MAKING WROUGHT-IRON. — William Price, McKeesport, Pa.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty permits have been granted, the more important of which are the following: —

Henry Hudson, three-st'y brick building, s w cor. Chesapeake and Dillon Sts., and 2 two-st'y brick buildings, e s Harris Alley, rear of above.

A. L. Gorter, 3 three-st'y brick buildings, e s Maryland Ave., n of Preston St.

J. A. Pixie, 4 two-st'y brick buildings, s s West St., commencing s w cor. China Alley.

Henry Roth & Co., 2 three-st'y brick buildings, n s Lombard St., w of Castle St.

A. Hanneman, 5 two-st'y brick buildings, w s Wolfe St., commencing s w cor. Hanneman Ave.

John E. Toole, 2 three-st'y brick buildings, n e s Druid Hill Ave., between Eutaw and St. Mary's Sts.

John F. Stone, 6 three-st'y brick buildings, e s Battery Ave., n of Clement St.

F. W. Malders, 5 three-st'y brick buildings and two-st'y brick stable, commencing s w cor. Calhoun and Lexington Sts.

Boston.

BUILDING PERMITS. — *Wood.* — *Cushing Ave.*, near Sawyer Ave., dwell., 27′ x 30′; builder, Wm. Gwynn.

Quincy St., near Cherry St., dwell., 22′ x 30′; owner, Dennis Higgins; builder, A. Nobble.

Ocean St., cor. Ashmont St., dwell., 26′ x 30′; owner, Josephine Gerry; builder, John Bass.

Norfolk St., cor. Wentworth St., stores and halls' 40′ x 40′; owner, G. W. Chipman, builder, Benjamin Rockwell.

Paris St., near Marion St., shed, 17′ x 40′; locker, 18′ x 30′; owner, City of Boston, Sewer Department.

Brooklyn.

BUILDING PERMITS.—*Cooper Pl.*, e s, 100′ s Herkimer St., 6 two-st'y brick dwells., tin roofs; cost, each, $3,000; owner, J. Pickering, New York City; architect, J. Platte; builder, J. Peters.

Nostrand Ave., n e cor. Quincy St., 5 four-st'y brown-stone stores and flats, tin roofs; cost, $7,000 and $8,500 each; owner and builder, Wm. Johnson, 224 St. John's Pl.; architect, I. D. Reynolds.

McDonough St., n s, 115′ w Lewis Ave., three-st'y brown-stone dwell., tin roof; cost, $7,000; owner, W. A. Welch, 255 Decatur St.; architect, I. D. Reynolds.

Eleventh St., s s, 217′ 10″ w Seventh Ave., 3 three-st'y brick flats, tin roofs; cost, total, $10,000; owner, J. Jack, 454 Ninth St.; architect, G. W. Bush; builders, J. Crouch and W. Brown.

Greenpoint Ave., Nos. 241 *and* 243, n s, 150′ w Provost St., 2 four-st'y frame (brick-filled) tenements, tin roofs; total cost, $12,000; owner, Eugene Pitou, 201 Hewes St.; architect, Th. Englehardt; builders, M. Metzen and J. Reed.

Seventeenth St., s s, 100′ e Fourth Ave., 5 two-st'y brick and brown-stone dwells., tin roofs; cost, each, $4,500; owner and architect, Geo. Ingram, 752 Fifth Ave.; builder, not selected.

Halsey St., s s, 100′ e Lewis Ave., 7 two-st'y brick and brown-stone dwells., tin roofs; cost, $4,800; owners and builders, Lambert & Mason, 148 Putnam Ave.; architect, I. D. Reynolds.

Manhattan Ave., w s, 218′ n Fourth St., four-st'y brown-stone tenement, gravel roof; cost, $6,000; owner, C. N. Gerard, Baldwins, L. I.; architect, E. B. Ackerly.

Jefferson St., n s, 210′ w Marcy Ave., 4 three-st'y brown-stone dwells., tin roofs; cost, each, $9,000; owner and builder, Geo. P. Phillips, 177 Hancock St.

Putnam Ave., n s, 495′ e Tompkins Ave., 5 two-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $4,500; owner and builder, Arthur Taylor, 409 Herkimer St.

Manhattan Ave., *No.* 505, w s, 75′ n Freeman St., four-st'y brick store and tenement, gravel roof; cost, $8,000; owner, Alonzo De Witt, 76 Green St.; architect, F. Weber; builders, J. Hatford & Son and J. Fallon.

Melrose St., n s, 200′ w Knickerbocker Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner and contractor, Caspar Gessmann, 138 Ellery St.; architect, G. Hillenbrand; mason, C. Wahle.

Evergreen Ave., w s, 25′ n Van Voorhees St., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner and builder, Fred. H. Shild, 241 Lynch St.; architect, Th. Engelhardt.

Pier southwest of Harrison St., one-st'y frame shed, gravel roof; cost, $5,000; owner, Estate of Chas. Kelsey, 156 Columbia St.; architect, S. C. Halstead; builder, J. Bulck.

George St., s s, 250′ w Knickerbocker Ave., 3 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $2,900; owner and contractor, A. Annan & Co., 269 Devoe St.; architect, G. Hillenbrand; mason, J. Auer.

George St., s s, 225′ w Knickerbocker Ave., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, etc., same as last.

Ann St., n w cor. Commercial St., three-st'y brick office, gravel roof; cost, $3,000; owner and architect, Havemeyer Sugar Refining Co.; builders, J. B. Woodruff and D. Wheedon.

Cook St., No. 11, n s, e Ewen St., three-st'y frame tenement, tin roof; cost, $4,000; owner, Mrs. Anna Fraas, on premises; architect, Th. Engelhardt; builder, J. Rauth.

Troutman St., s s, 275′ w Hamburg Ave., three-st'y frame (brick-filled) tenement; cost, $1,500; owner and builder, Fritz Salmon, 172 Jefferson St.; architect, Th. Engelhardt.

Hamilton Ave., Nos. 191-197, e s, 39′ s Cole St., 4 two-st'y brick stores and dwells., gravel roofs; cost, each, $3,000; owner, architect and builder, J. F. Nelson, 26 Manhassett Pl.

ALTERATIONS. — *Henry St., Nos.* 94 *and* 98, add one st'y, cost, $3,500; owner, John S. Sharpe, Main St.; builders, J. Gilfoyle and W. S. Wright.

Grand St., Nos. 22 *and* 24, cor. First St., five-st'y brick extensions, tin roof, new front on Grand St., and interior alterations, iron-work; cost, $12,000; owner, D. Allers, on premises; architect, E. F. Gaylor; builders, M. Smith and Jenkins & Gillies.

Butler St., n s, 300′ e Court St., three-st'y brick extension, tin roof; cost, $6,000; owner, St. Francis College, on premises; builders, J. J. Gallagher and M. Freeman's Sons.

Manhattan Ave., *No.* 568, raised twelve feet, frame story beneath; also two-st'y frame extension, tin roof, cost, $3,300; owner, Joseph Beaver, on premises; architect, M. D. Randall; builder, S. W. Randall.

South Portland Ave., s e cor. Hanson Pl., two-st'y brick extension, tin roof, new rear wall and interior alterations; cost, $11,000; owner, Hanson Pl. Baptist Church; architect and contractor, J. N. Smith; mason, J. De Mott.

Chicago.

CHURCH.—Adler & Sullivan, architects, planned Zion Temple on Ogden Ave., near Washington Boulevard, 65′ x 115′, brick, stone and terra-cotta front; cost, $35,000.

DWELLINGS. — Plans are just completed by Adler & Sullivan, architects, for two-st'y basement, mansard and tower roof dwell., at 3312 Wabash Ave., for B. Lindauer; cost, $25,000.

The same architects have plans completed for dwell. cor. Prairie Ave. and Gano St., 25′ x 76′, two-st'y and mansard, Anderson pressed-brick and brown-stone; cost, $13,000.

Same architects planned the dwell. 2915 Prairie Ave. for Henry Stern, 25′ x 80′, two-st'y and mansard, Anderson brick and brown-stone; cost 000.

BUILDING PERMITS. — J. V. Clark, 6 stores, 7 Halsted St.; cost, $5,000.

J. L. Gregaree, two-st'y dwell., 1076-1078 Ge St.; cost, $5,200.

R. R. Cable, two-st'y dwell., 110-114 Cass St. $40,000; architects, Cobb & Frost.

Sawyer & Lombard, 2 two-st'y dwells., 879-88 yer Ave.; cost, $6,000.

Sawyer & Lombard, 2 two-st'y dwells., 891-89 gle Ave.; cost, $6,000.

F. Woodruff, two-st'y flats, 1047 Taylor St.; $2,800.

H. C. Jacobs, 2 two-st'y dwells., 156-161 Thi St.; cost, $7,000.

Mrs. A. Blantx, 2 two-st'y dwells., 934-93 Buren St.; cost, $4,000.

A. Beck, additional st'y, 392-394 Clark St.; $1,500.

Mrs. E. Wells, two-st'y dwell., 36 Union Par cost, $3,500.

J. L. Lombard, 2 two-st'y dwells., 881-883 Ave.; cost, $6,000.

C. B. Sawyer, 4 two-st'y dwells., Sawyer cost, $12,000.

G. F. Beck, 2 two-st'y stores and dwells., 2 Carpenter St.; cost, $8,000.

F. Volradt, two-st'y store and dwell., 952 Tw first St; cost, $3,500.

J. Penshorn, two-st'y dwell., 188 Eighteent cost, $3,300.

M. Mojewski, three-st'y store and dwell., 77 waukee Ave.; cost, $7,000.

Mrs. A. Honkamp, two-st'y dwell., 3747 P Ave.; cost, $5,000.

Mrs. O'Connell, two-st'y dwell., 428 Taylor cost, $3,700.

Dr. Gurnea, three-st'y store and dwell., 3258 worth Ave.; cost, $5,500.

H. L. Parmelee, 2 two-st'y dwells., 963-971 C Park Ave.; cost, $3,200.

H. Schwaegerman, two-st'y store and dwell West Lake St.; cost, $4,000.

S. H. Wheeler, 8 two-st'y dwells., 826-832 W Ave.; cost, $40,000.

G. M. Hall, two-st'y dwell., 998 West Adam cost, $5,000.

J. Schweger, two-st'y addition, 613 West Fift St.; cost, $2,500.

F. Konpasek, three-st'y dwell., 166 Bunke cost, $4,300.

A. C. King, three-st'y flats, 231 Michigan cost, $12,000.

Mrs. M. Patrick, two-st'y flats, 3831 Wabash cost, $2,500.

Mrs. H. E. Simpson, two-st'y flats, 3833 W Ave.: cost, $2,500.

J. Jenson, two-st'y dwell., 662-664 Shober St.; $3,500.

J. Hoffmann, two-st'y store and dwell., 3558 sted St.; cost, $5,000.

M. Dougherty, 2 three-st'y stores and flats, 2 West Indiana St.; cost, $10,000.

P. Regan, two-st'y dwell., 353 West Fifteent cost, $2,800.

B. Conlin, two-st'y store and dwell., 1160 Western Ave.; cost, $3,800.

A. Schroeder, two-st'y dwell., 99-101 Kendall cost, $5,500.

R. Watts, three-st'y store and dwell., 694 Va ren St.; cost, $5,000.

H. Hemmelgarn, two-st'y dwell., 719 Full Ave.; cost, $15,000.

H. B. Satford, two-st'y flats, 912 Thirty-sixth cost, $2,800.

C. R. Sawyer, 2 two-st'y dwells., 859-861 Sa Ave.; cost, $6,000.

Emanuel M. E. Church, one-st'y church, 26 Marshfield Ave.; cost, $14,000.

Erie St. M. E. Church, one-st'y church, 60 West Erie St.; cost, $7,000.

O. H. Helm, basement, Melton Ave.; cost, $

M. Karzyaski, two-st'y dwell., 730 Noble St.; $3,700.

Mrs. Goodnow, 2 two-st'y dwells., 743-747 Fair Ave.; cost, $4,500.

P. Rice, two-st'y store and dwell., 151-153 N Western Ave.; cost, $4,000.

Geo. Morris, 4 three-st'y dwells., 1901-1909 C St.; cost, $15,000.

Geo. Morris, 3 three-st'y store and dwells., 18 Twentieth St.; cost, $10,000.

W. H. Maple, 3 two-st'y dwells., 41-45 Cam Park Ave.; cost, $7,500.

Chas. Forester, 2 two-st'y dwells., 510-512 A Ave.; cost, $4,000,

C. P. Dewey, two-st'y dwell., 634-638 Lake Ave.; cost, $ 0,000.

J. M. Love, two-st'y dwell., 3132 Calumet A cost, $27,000.

D. A. Titcomb, two-st'y store and dwell., 126 N West Ave.; cost, $4,000.

J. McHenry, two-st'y store and dwell., 119 Fu ton Ave.; cost, $3,000.

W. B. Barber, three-st'y store and dwell., 47 S St.; cost, $10.000; architects, Thomas & Rogers.

B. Hagaman, two-st'y dwell., 3133 Calumet A cost, $10,000.

J. Bergstein, three-st'y dwell., 253 Fremont cost, $5,000.

Mrs. S. E. Hale, 2 two-st'y dwells., 3208-3210 C met Ave.; cost, $10,000; architect, A. Smith.

F. O. Seivert, three-st'y flats, 578 North Market cost, $7,000; architect, H. Kley.

C. Venn, two-st'y dwell., 78 Cornell St.; cost, 50.

Thos. Kavanaugh, two-st'y flats, 926 West Twe St.; cost, $4,500.

H. Raepeke, one-st'y factory, 356-362 North S gamon St.; cost, $10,000.

C. H. Adams, two-st'y store and dwell., 424 North Halsted St.; cost, $7,000.

C. Seipp, 3 two-st'y dwells., 3000-3004 Grovel Park Ave.; cost, $21,000.

R. H. Peters, three-st'y dwell., 267 Lasalle A cost, $2,500.

E. Ledger, 3 two-st'y dwells., 3228-3230 South P Ave.; cost, $10,000; architect, C. Palmer.

R. E. Shimmin, two-st'y dwell., 535 West Jackson St.; cost, $4,000.

Kansas City, Mo.

BUILDING PERMITS. — H. Cree, brick house, cor. Twenty-first and McGee Sts.; cost, $3,000.

H. Tobener, block cor. Fifteenth and Oak Sts.; cost, $5,500.

L. Huth, block, 705 and 707 Penn St.; cost, $7,500.

W. H. Allen, block on Tracy Ave.; cost, $4,500.

Mrs. M. B. Reardon, brick house, 565 Grand Ave.; cost, $3,000.

Deardorff Estate, four-st'y brick business block, 1101 Main St.; cost, $65,000.

Isaac Gordon, brick business building, 812 Main St.; cost, $3,000.

New York.

CHURCHES. — The Trustees of the old Epiphany House are to have a brick church, 80' x 98' on Stanton St., between Norfolk and Essex Sts., to cost $50,000, from designs of Mr. C. C. Haight.

A Presbyterian Church is to be erected on East Seventy-second St. and Second Ave., on a lot 100' x 102'.

HOUSES. — For Mr. L. Weissman a four-st'y stone house, 25' x 87', is to be built at No. 1 East Eightieth St., at a cost of $50,000, from plans of Messrs. A. Zucker & Co.

On the s s of Seventy-eighth St., 175' e of Fifth Ave., six houses are to be built by Messrs. C. Graham & Sons.

BUILDING PERMITS. — *Baxter St., No.* 145, five-st'y brick tenement, gravel roof; cost, $18,500; owner, Thomas H. Wilcox, 327 West Ninety-second St.; architect and mason, Geo. W. Hughes; builders, Breen & Nason.

Grand St., n e cor. Wooster St., five-st'y brick and iron front store, tin roof; cost, $40,000; owner, Wm. W. Winans, 3 East Forty-seventh St.; architect, G. W. Da Cunha.

Sullivan St., e s, 95' s Houston St., granite basement of proposed church; cost, $30,000; owners, Church of St. Anthony of Padua, Rev. Father Anacletus, 106 Sullivan St.; architect, Arthur Crooks; builders, James D. Murphy and James Thompson.

Thirty-ninth St., n s, 500' w Eleventh Ave., one-st'y brick building, tin roof; cost, abt. $5,000; owners, Stern & Metzger, Fortieth St., w of Eleventh Ave.; architect, John McIntyre.

Sixteenth St., s s, 46' w First Ave., four-st'y brick flat, tin roof; cost, $9,000; owner, Nicholas Duffy, 346 East Sixteenth St.

East Forty-second St., No. 514, three-st'y brick tenement, tin roof; cost. $4,000; owner, John Ryan, 512 East Eighty-second St., architect, J. Brandt.

East One Hundred and Twentieth St., No. 325, two-st'y brick dwell., felt and gravel roof; cost, $5,000; owner, William Reichert, 327 East One Hundred and Twentieth St.; architect, Chas. Baxter; builder, A. B. Edwards.

Second Ave., e s, One Hundred and Tenth to One Hundred and Eleventh Sts., 8 five-st'y brick tenements with stores, tin roofs; cost, cor. buildings, each, $19,000, others, each, $17,000; owners, Riley & Cunningham, 416 East One Hundred and Fifteenth St.; architect, John Brandt.

Seventy-first St., n s, 338' e First Ave., five-st'y brick tenement, tin roof; cost, $10,000; owner, Mary Brosemer, 2225 First Ave.; architect. F. S. Barus.

One Hundred and Seventh St., s s, 94' e Third Ave. six-st'y brick storehouse, tin roof; cost, $16,000, owner and builder, Thomas McManus, 709 Lexington Ave.; architect, J. H. Valentine.

East One Hundred and Twenty-third St., No. 307, one-st'y brick dwell., and one-st'y brick store, tin roofs; cost, total, $7,000; owner, Edward Roberts, 1777 Third Ave.; architect, Andrew Spence.

Sixtieth St., n s, 320' e Ninth Ave., 3 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $8,000; owner, Gideon E. Fountain, 59 East Seventy-ninth St.; architects, A. B. Ogden & Son.

Sixtieth St., n s, 175' e Ninth Ave., 8 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $8,000; owner, John Davidson, 116 East Fifty-sixth St.; architects, A. B. Ogden & Son.

West One Hundred and First St., No. 611, three-st'y and basement brick dwell., tin roof; cost, $13,000; owner, Harriet L. Pond, Tenafly, Bergen Co., N. J.; architect, W. Holman Smith; builders, Norman Andruss and Outwater & Felter.

Bathgate Ave., No. 1878, two-and-one-half-st'y frame store and tenement; cost, $3,000; owner, Caroline Haas, 1872 Bathgate Ave.; architect, J. C. Kerby.

Ryder Ave., s w cor. One Hundred and Forty-fourth St., three-st'y brick tenement, felt and gravel roof; cost, $4,000; owner, Michael O'Neil, 484 East One Hundred and Forty-second St.; architect, Geo. La Coste.

Washington Ave., e s, 86' n One Hundred and Seventy-sixth St., three-st'y brick dwell., deck roof tinned, mansard slated; cost, $10,000; owner, C. A. Becker, Tremont, New York City; architect, Geo. K. Thompson; builder, James E. Dolan.

ALTERATIONS. — *Thirty-ninth St.*, n s, 225' e First Ave., one-st'y brick extension, iron and slate roof; cost, $13,000; owners, Equitable Gas Light Co., Fortieth St. and First Ave.; architect, A. W. P. Cramer; builder, R. Deeves.

Clinton Pl., No. 91, attic raised to full st'y; cost, $5,000; H. W. Poor, 45 Wall St.; builders, A. G. Bogert & Bro.

Monroe St., No. 200, internal alterations in schoolhouse; cost, $14,000; owners, the mayor, aldermen, etc.; architect, D. J. Stagg; builder, F. Mitchell.

Wall St., Nos. 78 *and* 80, *and* 158 *Pearl St.*, raised 8'; cost, $35,000; owner, M. H. Levin, Brevoort House; architect, H. J. Hardenbergh; builder, not selected.

Nassau St., Nos. 168 *and* 170, basement floor strengthened, iron girders and partition furnished; cost, $3,000 to $4,000; owners, Sun Printing and Publishing Assoc., on premises; builders, Henry Andrews and A. C. Hoe & Co.

Broadway, s w cor. Twenty-ninth St., brick wall supported by iron columns and girders, bet. stage and auditorium; cost, $5,000; owner, estate of Peter Gilsey, 1193 Broadway; architect, S. D. Hatch; builder, not selected.

West Forty-second St., Nos. 331, 333 *and* 335, one-st'y brick extension, slate and tin roof; cost, $25,000; owner, Charles McCready, 329 West Forty-second St.; architect, L. W. O'Connor; builder, C. Callaghan.

Twenty-eighth St., n s, abt. 150' e Second Ave., iron mansard built; cost, $4,000; owners, W. H. Jackson & Co., 17 Union Sq.; architect, A. Zucker & Co.

West One Hundred and Twenty-fifth St., No. 256, raised one st'y, also cellar excavated and built, brick extension, tin roof; cost, $8,000; owner, Margaret J. Paddock, Seventh Ave., cor. One Hundred and Twenty-fourth St.; architect, J. F. Miller; builder, W. B. Birdsall.

Philadelphia.

BUILDING PERMITS. — *Brown St.*, near Ash St., 2 two-st'y dwells., 16' x 42'; A. R. Crosta, owner.

Sharp St., above Hermit St., three-st'y dwell., 17' x 42'; Jas. Boone, contractor.

Nineteenth St., s of Dickinson St., two-st'y dwell., 16' x 46'; C. Newman, contractor.

Snyder Ave., w of Eleventh St., 5 two-st'y dwells., 16' x 65'; J. Stickney, owner.

Thomas St., near Green St., two-st'y dwell., 17' x x 46'; M. C. Bailey, contractor.

Mutter St., n of York St., 3 two-st'y dwells., 12' x 28'; Thos. Henderson.

Hancock St., n of York St., 3 three-st'y dwells., 12' x 28'; Thos. Henderson.

Queen St., n of Pulaski St., two-st'y dwell., 17' x 42'; Chas. Neiman, contractor.

Front St., cor. Norris St., warehouse, 21' x 119'; Eldredge & Stewart, contractors.

Wayne St., cor. Greene St., 2 three-st'y dwells., 29' x 37'; Geo. Hearst, contractor.

Rittenhouse St., n of Greene St., 4 three-st'y dwells., 20' x 48'; contractor, same as last.

Elm St., No. 1239, two-st'y dwell., 17' x 37'; Jas. McCaulley, contractor.

Walnut St., No. 1128, addition, 23' x 42'; Thos. A. Lynch, contractor.

North Fifteenth St., No. 328, two-st'y building, 14' x 96'; Andy Moore, contractor.

Philipp St., No. 2501, alterations, 14' x 65'; R. Berneger, contractor.

Pike St., cor. Rising Sun Lane, two-st'y dwell., 20' x 56'; P. Blunn, contractor.

Adrian St., n of Gerard Ave., 3 three-st'y dwells., 12' x 16'; A. Filemyer, owner.

Twenty-eighth St., e s, s of Fletcher St., 3 three-st'y stores and dwells.; C. Lanahan, contractor.

Second St., s of Venango St., three-st'y store and dwell.; A. Wunder, contractor.

Paul St., s of Meadow St., 2 three-st'y dwells.; E. A. Swope, owner.

Seventh St., w s, s of Venango St., 6 two-st'y dwells.; W. W. Scargle.

Twenty-fourth St., s of Berks St., 11 three-st'y dwells.; C. C. Moore, contractor.

Montgomery Ave., cor. Thompson St., three-st'y dwell.; Jos. McCaulley, contractor.

Mervine St., w s, s of Somersett St., 2 two-st'y dwells.; J. G. Tomlinson, owner.

Howard St., n of Huntingdon St., alterations and additions to factory; Jas. McCartney, contractor.

St. Louis.

BUILDING PERMITS. — Forty-eight permits have been issued since our last report, ten of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

F. C. Riddle, two-st'y frame dwell.; cost, $5,000; contractor, Aug. Kohlmeyer.

P. Tieman, 3 adjacent two-st'y brick stores and tenements; cost, $6,200; contractor, P. Tieman.

J. G. Joice, two-st'y brick dwell.; cost, $5,250; architect, W. C. Slicer; contractor, T. Murphy.

H. F. Kaiser, two-st'y brick dwell.; cost, $2,650; contract sub-let.

A. Joch, two-st'y brick dwell.; cost, $3,000; contractor, J. C. Hacker.

William Ostermann, two-st'y brick dwell.; cost, $4,400; contractors, Shettman & Gross.

J. H. Boederer, two-st'y brick dwell.; cost, $1,000; architect, H. E. Peiper; contractors, T. H. Tranel & Co.

T. F. Bracklon, two-st'y brick store and dwell.; cost, $4,500; contractor, Geo. L. Gerton.

Fred. Fassler, two-st'y brick dwell.; cost, $2,500; architect, O. Koenig; contractors, Wm. Herkonoff & Bro.

Miss E. Harris, two-st'y brick dwell.; cost, $4,000; architect, J. B. Legg; contractor, A. J. Creamer.

Chas. Heil, two-st'y double brick dwell.; cost, $4,000; architect, O. P. Koenig; contractors, Frank & Harmann.

T. Smith, two-st'y double brick dwell.; cost, $4,000; architect, Thomas J. Furlong; contractor, M. B. Scanlon.

Jos. Zaonne, two-st'y brick store and dwell.; cost, $12,000; architect, G. B. McElfatrick; contractor, S. H. Hoffmaun.

R. W. Hasbagen, two-st'y brick store and dwell.; cost, $3,200; contractor, A. McAllister.

St. Paul, Minn.

BUILDING PERMITS. — Three-st'y brick double dwell., w s of Washington St., between Third and Eagle Sts.; cost, $10,000; owner, A. Foos.

One-st'y frame church, n s of Winnifred St., between Clinton and Greenwood Sts.; cost, $4,000; owners, Trustees of the Westminster.

Two-st'y frame store and dwell., n s of Front St., between Chatsworth and Lexington Sts.; cost, $2,000; owners, J. Arnold & Co.

Two-st'y frame double dwell., s s of Feronia St., between Westwood and Albion Sts.; cost, $4,500; owner, H. W. Carter.

Two-st'y frame dwell., s s of Parker St., between Wilder St. and Union Ave.; cost, $3,300; owner, C. W. Southwick.

Two two-st'y brick dwells., n s of Eleventh St., between Jackson and Robert Sts.; cost, $4,000; owner, Paul Haupt.

Two-st'y frame double dwell., n s of Grant St., between Viola and Bianca Sts.; cost, $4,000; owner, Wm. Stockton.

Toledo.

FACTORY. — *Superior St.*, cor. Oak St., four-st'y and basement brick manufacturing building, for Woolson Spice Co., owned by D. R. Locke ("Nasby"); cost, about $33,000; N. B. Bacon, architect; A. Lombard, builder.

STABLE. — *Jefferson St.*, cor. Twenty-third St., two-st'y brick stable, for S. C. Schenck; cost, about $3,000; N. B. Bacon, architect; A. Bentley, builder.

STORES. — *Adams St.*, cor. St. Clair Street, two-st'y brick business building, for M. A. Scott; cost, about $9,000; N. B. Bacon, architect; C. F. Hall, builder.

TRAINING-SCHOOL. — *Adams St.*, cor. Tenth St., manual training-school, brick, three-st'y and basement; cost, about $40,000; E. O. Fallis & Co., architects; A. Bentley, carpenter-work; Hanahan Bros., brick-work.

WAREHOUSE. — *Erie St.*, cor. Lucas St., five-st'y brick warehouse, for Jno. A. Moore; cost, about $11,000; A. Lombard, builder; N. B. Bacon, architect.

HOUSES. — *Jefferson St.*, near Twentieth St., double brick dwell., two st'y and basement; cost, about $9,000; T. J. McDonnell, owner; A. Liebold, architect; Carl Schmuhl, builder.

Summit Ave., 4 frame cottages, two stories and cellar, for Estate of late David Smith; cost, $10,000; N. B. Bacon, architect; R. Hattersley, builder.

Locust St., brick double dwell. for Mrs. Coldham; cost, about $5,000; architect and builder, same as last.

Twelfth St., two-st'y and basement frame dwell., for W. W. Tryon; cost, about $3,500; N. B. Bacon, architect; A. Lombard, builder.

Collingwood Ave., two-st'y frame dwell., for O. Newman; cost, $3,000; O. W. Vallette, architect.

Parkwood Ave., two-st'y frame dwell. for J. W. Dowd; cost, about $3,000; D. W. Gibbs & Co., architects.

Monroe St., three-st'y frame dwell., for W. H. Scott; cost, about $3,500; N. B. Bacon, architect; Jno. Arnsman, builder.

Parkwood Ave., two-st'y frame dwell.; cost, about $2,500; J. A. Barber, Esq., owner; N. B. Bacon, architect; C. F. Hall, builder.

Parkwood Ave., two-st'y frame dwell., for H. W. Compton; cost, about $2,500; N. B. Bacon, architect; W. H. Keyser, builder.

Woodruff Ave., two-st'y frame dwell., for G. M. Jaquet; cost, about $2,500; N. B. Bacon, architect.

General Notes.

ALLIANCE, O. — Dwell. for R. W. Feeters; J. T. Weybrecht, contractor; Guy Tilden, architect; being built on Market St., Alliance, O., and which will cost $7,000, is about ready for the plasterers.

BUCYRUS, O. — Three-st'y and basement business building and opera-hall, for Vollrath Bros.; cost, about $18,000; N. B. Bacon, architect, Toledo, O.; Vollrath Bros., builders.

CANTON, O. — Guy Tilden, architect, of Alliance, O., is preparing the drawings and specifications for an infirmary for Stark Co., to be built near this town, and which will cost $100,000.

J. H. Wilhelm, of Canton, has been awarded the contract for building the addition to the County Infirmary, which is to be used as an Insane Department; Mr. Guy Tilden, architect; cost, $10,000.

Guy Tilden, architect, is preparing the drawings for the new Trinity Lutheran Church, to be built on West Tuscaroras St., Canton, O. It is to be 70' x 126', will seat about 600, and is to be built of stone, at a cost of about $30,000.

Bids and Contracts.

DALLAS, TEX. — The following is a synopsis of bids for iron beams, etc., for the first-st'y floor of the court-house, etc.: —

Dearborn Foundry Company, 1525 Dearborn St., Chicago, Ill., $980 (*accepted*).

Snead & Co., Louisville, Ken., $1,046.

T. H. Brooks & Co., Cleveland O., $1,132.

WASHINGTON, D. C. — List of proposals received and opened at 2 P. M., August 7, 1885, for laying roofing-paper or felt and terne plates on central roofs of new Pension Building: —

W. H. Rapley, price per 100 sq. ft., $.98¾; contract awarded.

W. B. March, $1.74.

J. W. Barker, $1.63.

Tennyson & Talbot, $2.00.

J. Greer, $1.20.

James Steele, $1.30

C. A. Haman, $1.25.

John McMahon, $1.23.

Wm. J. Ferguson, $1.23.

Geo. E. Gartrell, $1.00.

Fisher & Johnson, $2.05.

Thos. Killigan, $1.25.

S. G. Bovis, Agent, $1.45.

List of proposals received and opened at 2 P. M., August 7, 1885, for furnishing roofing-paper or felt, terne plates and tinned nails for fire-proof building for Pension Office: —

C. W. Thorn & Co., felt or paper (per 100 sq. yds.), $2.30.

Phelps, Dodge & Co., New York, terne plates, per box, $6.55; contract awarded.

Warren Chemical Manufacturing Co., New York, felt or paper, delivered in New York, $6.00, $4.00, $3.40, 2.00, 2.45 and 2.90; delivered in Washington, $6.35, $4.25, $3.85, $2.30, $2.80, $3.25.

Mica Roofing Co., New York, felt or paper, delivered at Washington, $6.45, $2.70, $2.36, $2.19.

New York Coal Tar Chemical Co., New York, felt or paper, delivered in Washington, $2.10

Shultz & Co., Baltimore, terne plates per box, $6.55.

American Roofing Co., New York, for metal shingle patent metal roof-plates, kalom, per 100 lbs., $5.00, $4.25 and $5.25.

A. Dunlap Gordon, Philadelphia, felt or paper, No. 1, 1½ c. per sq. ft.; No. 4, 3 c.

Merchant & Co., Philadelphia, terne plates, per box, $6.75; nails, $5.45 per 100 lbs.; contract awarded.

Tennyson & Talbot, felt or paper, 2¼ c. per lb.; terne plates, per box, $6.95; nails, 6¾ c. per lb.; felt, $89.25 per 60,000 square feet; contract awarded.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII | Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. | No. 504.

AUGUST 22, 1885.

Entered at the Post-Office at Boston as second-class matter.

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WE took occasion last week to speak with disrespect of the stone chimneys which occasionally do duty for monuments in this country, and which, inoffensive as they would be in themselves, are rendered odious by the protestations of those who are responsible for them that they "exactly resemble" Egyptian obelisks, the inference being that as Egyptian obelisks are interesting, if not beautiful, the structures which profess to imitate them must also be things to be proud of. We even see occasionally such arguments used to invite applause for the Washington Monument, a building which might perhaps resemble an Egyptian obelisk if it were not destitute of every quality of line, proportion and decoration which distinguishes a real obelisk from a pier of a railway bridge; and it would sometimes be difficult to avoid a little resentment at what seems to an educated man an attempt to impose on his presumed ignorance, if it were not for the reflection that just such assertions were once made about buildings with battlements four inches square, or with porticos set with columns sixteen diameters high, which were put forth as exact imitations of mediæval castles and Grecian temples. As, however, we have outgrown the gingerbread Gothic and the attenuated Doric of our grandfathers, we may yet outgrow the slab-sided obelisks of the generation just now passing away; and we are inspired with a special hope of this by the perusal of a description of the design just adopted for the monument to be erected on the field of the battle of Bennington, from the design of Mr. J. Philip Rinn of Boston. According to this description, the monument is to be three hundred feet high, as is perhaps appropriate for a structure intended as an æsthetic light-house, to mark from afar the spot which it commemorates; but instead of being started at the bottom with a battering rule, carried up until the money gives out, and then roofed over, it is actually to have a definite and predetermined shape. More than this, there is intended to be a fixed and agreeable proportion between the height, the size at the base, and the size at the top of the monument, to be determined by careful study on the part of the designer, and carried into execution, we hope, without the ruthless amputations or elongations which the artist's work in such cases is apt to suffer at the hands of committees. But more than all these, the profiles of the shaft, instead of soulless straight lines, are, like those of real Egyptian obelisks, as well as of all Greek buildings and of all vertical shafts whatever in classical times, to be composed of curves, upon which the artist can lavish all the feeling of which he is capable. In other respects than this the monument will be comparatively plain, some bas-reliefs apparently forming a mere surface decoration near the base; but if the idea of making the work a study in pure lines is carried out, the less it is disturbed by rich accessories the better. We shall hope to see later in the completed structure what Mr. Rinn is capable of; but meanwhile we can at least commend his choice of a treatment which, though difficult, presents an opportunity for the display of the highest artistic gifts; and we hope we shall not only encourage him, but engage for him the utmost consideration on the part of his committee, by saying that the powers of the greatest artist might be fully employed for a lifetime in perfecting the entasis and modelling of such a shaft; and, dull as our modern eyes are to intellectual beauty, we believe that every hour of a lifetime so spent would, even among us, meet with its reward in public appreciation.

A REPORT has recently been made to the Italian Government by a Commission, presided over by the Marquis Nobile-Vitilleschi, which has spent several years in investigating the condition of the rural districts of the kingdom. The report is in eleven volumes, and seems to have been prepared with great care, but the evidences of thorough investigation and precision in statement which it contains only make the picture of Italian life presented by it more gloomy. As might, perhaps, be expected, the Commissioners find that malaria is the most potent physical factor in depressing the condition of agriculture. To say nothing of the Campagna and the Maremma, whose pestiferous atmosphere has been renowned for a thousand years, many other parts of the peninsula, naturally the most fertile, are desolated by the same evil influence, which the peasants and poor farmers, burdened as they are with taxes, debts, rents and mortgages, have not the heart to try to resist. The Roman Campagna once a prosperous and beautiful suburban district, crowded with thriving villages, now, according to the Report, which devotes a whole volume to it, "presents more evils to be cured than any other part of the entire kingdom." The efforts which have been made in the way of draining the marshes, and planting sunflowers and eucalyptus trees, seem to have been quite fruitless, and at present the country is inhabited, in the proportion of one family to every four square miles, by a population which for eight months in the year keeps up a feeble show of cultivation and pasturage, but on the approach of midsummer abandons its work and flees to the hills. Under these circumstances the condition of the district grows worse rather than better. Farms are by degrees abandoned, and the cultivated tracts, falling into neglect and decay, add to the area of poisonous marsh. It is well known that thorough cultivation, and especially the planting of trees, would soon exterpate malaria, but the rate of taxation on improved property is so high that the great nobles and ecclesiastical corporations, who own five-sixths of the Campagna, are unwilling to add to their investment the cost of the planting and drainage works which they alone could carry out with substantial results; and the small farmers who occupy the remaining one-sixth of the country, find, like the monks of Tre Fontane, that their utmost efforts in trying to reclaim to salubrity small tracts surrounded by neglected and pestilential ones are simply thrown away. What can be done, either by the Government or private individuals, to mitigate this great evil, it is hard to say. All writers seem to be agreed that the system pursued by the great proprietors, of letting farms to middlemen for what they will bring, or carrying them on by means of overseers, is the main source of the neglect, and consequent unhealthfulness into which the whole district has fallen, and that a sub-division of the land, which is naturally very fertile, into small, highly-cultivated farms or market-gardens, would result in its complete restoration; but there seems to be no way, either of instilling new principles into the princely and reverend landlords, or of taking away their estates, to give them to more practical and industrious persons. Perhaps the solution of the problem may come ultimately from the growth of Rome itself. Even now the demand for provisions for the city is far greater than the immediate neighborhood can supply, and the markets are supplied from the environs of Naples, a hundred and eighteen miles away; and if the tenure of the Roman plain could be so changed as to unite its division into such "truck farms" as those which excite the admiration of the scientific agriculturist in the neighborhood of our own cities, there can be no doubt that malaria would disappear from these portions, while enforced planting with forest trees would probably cure the remainder.

THE Government engineers at Hell Gate, in New York harbor, are preparing for an explosion which will dwarf that of three or four years ago into insignificance. Every one knows that the vast operations going on beneath the surface of the narrow and dangerous northern entrance to the harbor are intended to clear away so effectually the rocks which now beset the channel that steamships of the deepest draught will be able to pass through safely. In fact, so important a

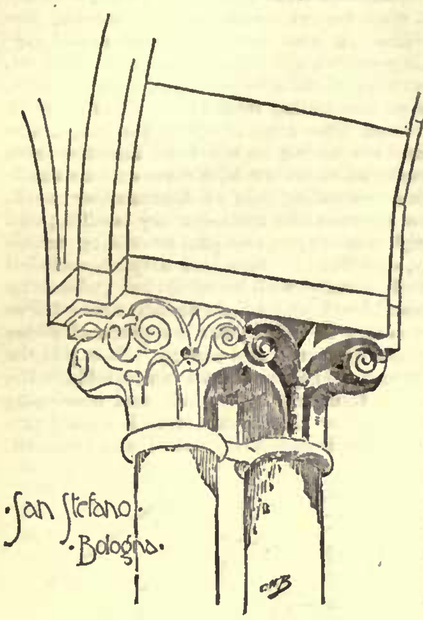
change will be made by the excavation, that it is said that the foreign steamships, instead of sailing thirty miles southward to Sandy Hook, and waiting for high tide to float them over the bar, before they can get out of the harbor, will, when the Hell Gate obstructions are removed, take their regular course through it, and through Long Island Sound, of which it forms the entrance, saving thus many miles of distance and about half a day's time on each voyage. Whether this modification of the regular transatlantic course, with the consequent transfers of the great docks from Jersey City and the neighborhood of the Battery to Harlem, will really take place, we cannot say, but this does not affect the interest of the great submarine work which is to be completed on the first day of next October, by the firing of a mine which will throw the last of the Hell Gate obstructions into the air. Although the series of rocks and shoals which beset the strait was originally very extensive, their removal has been effected by what is really the most economical means, enormous blasts of dynamite. It is well known that the high explosives act to much better advantage when many charges are fired at once, and so far is this principle carried in the Hell Gate work, that on the appointed day nearly sixty thousand dynamite cartridges, containing two hundred and seventy-five thousand pounds of the material, are to be set off in an instant by a single electric spark. These cartridges are now in process of being deposited in cavities excavated for them in the rock, by means of tunnels and galleries extending from the shore, and ramifying in all directions, but preserving everywhere the necessary distance from the exterior of the work to secure the calculated resistance which the dynamite is intended to overcome. In order to place the cartridges where they will just do the work required of them, it has been necessary to excavate one hundred and sixty thousand tons of hard rock, all of which has been thrown into a deep hole in the channel, just north of Blackwell's Island. This work, all of which has been carried on beneath the surface of the river, has occupied six or seven years, and has cost more than a million dollars, and the closing operation, which will leave nothing more to be done but to dredge out the fragments of stone from the channel, will be anticipated with considerable anxiety.

THE subject of fire-losses seem to attract more and more attention throughout the country, and it is much to be hoped that some good may come of the discussion which is taking place. The Detroit *Free Press* seems to deserve the credit of first looking at the subject from a new and very interesting point of view; and calls the attention of its readers to the various useful and valuable things that the people of the country might buy with the two million dollars a week which they could have, if they wished, in place of the excitement of fires, by simply making it obligatory, or advantageous, for those who build to do so in such a way that their houses will not burn. The fact cannot be too often insisted upon that every father of a family in the United States pays out, on an average, ten dollars a year, or about the sum which would keep his children supplied with school-books, for the simple purpose of enabling his neighbors to enjoy the sport of burning their houses down. To take a particular case, the folly, to call it by no worse name, of the officers of the Atchison, Topeka and Santa Fé Railroad, who have contrived to build an enormous hotel in such a way as to have it burned down twice within a few months, has literally been the means of extorting somewhere about forty cents from the pocket of every American who has a family to support. This is not a very large sum, it is true, but it is an appreciable one to those who have hard work to make both ends meet, and, small as it is, most of these would rather spend it in some other way than in contributing to make good the losses which a few rich old gentlemen in Boston brought upon themselves and the stockholders whose property they managed by a recklessness which is only too characteristic of such persons. The case of the Montezuma Hotel seems, indeed, to have been a particularly discreditable one. Everything in the climate of the territory where it was situated, the character which it was desirable for the interests of the railroad company, to give to the new watering-place of which it formed the most important feature, as well as to the building which thousands of guests were to be invited to occupy, pointed to the expediency of constructing the hotel in such a way that it would not be likely to destroy at any moment nine-tenths of the people who happened to be entrapped in it; and the failure to do so, especially after the warning given by the fire which swept away the miserable shell first erected, deserves the punishment which will probably follow it, in the avoidance by the public for the future of all hotels and pleasure resorts with which the name of the Atchison, Topeka and Santa Fé Railroad is connected.

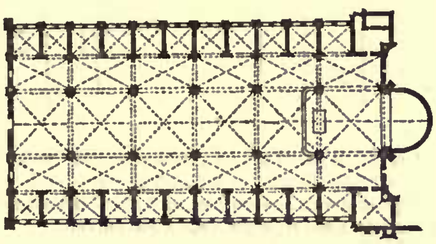
SOME of our readers have probably heard of the clever and learned, but eccentric, Stephen Pearl Andrews, a Transcendentalist of the Concord school, and, we believe, a member of the celebrated Brook Farm community, who, after a youth spent in successful literary work, was led by an indiscreet enthusiasm to dissipate the force of his maturer years in continuing the pursuit of those lofty chimeras which his more prudent comrades had stopped chasing long before. Among the labors which, some fifteen years ago, occupied the mind of Mr. Andrews, or Andrusius, as he then preferred to be called, was the construction of a universal language which every one would understand as soon as he heard it spoken, and all would be able to speak without learning it. We must confess that our own efforts to understand some specimens of this language, which was named Alwato by its inventor, proved abortive, but this may have indicated simply that our mind was not in a receptive condition, and the theory on which it was based, that there is a relation between given sounds and the feelings expressed or excited by them which may, with attention, be perceived, has certainly an air of plausibility, if nothing more.

WITHIN a few years the Alwato language of Andrusius has found a rival in a universal commercial language, devised by Herr Schleyer, of Constance in Switzerland, and known as the Volapük. There is a story told of Hannibal, which relates that, being forced to address a public assembly of the Carthaginians upon a subject very distasteful to them, he began his speech by saying that he could tell the thoughts of every person in the audience. Being challenged by several to do so, he replied that every man was thinking how he could buy something cheap and sell it dear. The Carthaginians were a nation of traders, and not one could deny that his mind had been upon some such topic; so that there was a general laugh, and Hannibal, having put the people in good humor, was able to pursue his subject with safety. The moral of this tale, as applied to the present subject, is that the range of the commercial sentiments is not, perhaps, so large as to require a very copious language for their expression; but commerce certainly deals with a great variety of material objects, and it cannot be denied that a method of designating such objects which should be intelligible in all trading nations, would be of great use. Herr Schleyer has sought this object, not by looking in his own heart for the significance of sounds, but by the more prosaic process of collecting words, or rather roots of words, from the principal European languages, and associating them by a construction simple enough to be comprehended even by the half-civilized African and Asiatic tribes. It is said that the English, or rather, perhaps, the Anglo-Saxon language, has been especially drawn upon for rudimentary words, although the name given to the new language suggests anything but an Anglo-Saxon origin. According to *Le Génie Civil*, Herr Schleyer's invention has already met with great success in the commercial world. Although his first work on the subject was only published in 1881, thousands of persons in various parts of Europe already speak Volapük with facility; fifty-three societies, scattered over England, Germany, Austria, Sweden, Holland, Asia Minor and the United States, are engaged in disseminating a knowledge of it; four editions of the first Volapük-German dictionary and grammar have already appeared; and Volapük grammars for the use of Hottentots and Chinese, besides all the European nations, are either in the market or in course of preparation; while two reviews, one entirely in Volapük, and named the *Volapükaklubs*, and the other, known as the *Volapükabled*, with a translation on the alternate pages, are regularly published. An experiment with the new language was made at the school for higher commercial studies in Paris, and it was found that after eight lessons the students in the class could correspond easily and correctly with other students of the language in foreign countries. Such a result as this certainly indicates that the new invention possesses great practical value; and it is not surprising that the enthusiastic advocates of the system have already arranged for free public lectures and lessons in the language, which will begin in various places next autumn.

BOLOGNA.



BOLOGNA is always vaguely associated in our minds with enormous sausages, a huge, unfinished church, and a heavenly St. Cecilia, associations of a somewhat heterogeneous character, in which architecture, whether practical or æsthetic has but a small share. Indeed I almost question whether after visiting the city our most vivid remembrances of it do not pertain more to the saint and the sausage. The first impression of Bologna is not altogether agreeable. Leaving the railway station one passes through long, noisy streets, and under interminable arcades which shut out not only the sun, but the fresh air as well; and it is a good half hour's walk before anything architecturally interesting appears, if indeed such a term can be applied to the overgrown, barren church of San Petronio. The people of Bologna have always been very ambitious, and ever since the days when their ancestors, the Boii, came pouring out of the German forests, and appropriated the richest farm lands of all Italy, the citizens have striven for the best of everything. San Petronio was to be the largest church in the country, larger even than Santa Maria del Fiore at Florence. It was completed, however, only as far as the transept, and is now included in the long category of Italian churches whose builders possessed more imagination than length of purse. It is almost a pity the scheme was not carried out. The contemplated plan is interesting and highly suggestive of opportunities which might have led to something better than was developed at Florence. The entire length was to be nearly six hundred feet, and with the wide, double-aisled transepts and high octagonal dome over the intersection, the effect would have been very imposing, for mere largeness often goes a long ways towards producing architectural success. Still the ideas of the Bolognese of that day may have been as obscured as their estimate of church finances; certainly the existing interior is exceedingly bare and uninviting. The church now is three hundred and eighty-four feet long, and about one hundred and fifty feet wide.



San Petronio, Bologna.

Bologna is quite rich in well-preserved types of palace architecture of the late Gothic and early Renaissance periods, and though nowhere does one find the studied simplicity and careful attention to proportions which were so pleasingly considered in the Florentine work of the corresponding times, the northern city shows a freer treatment and at times almost a Venetian feeling, especially in the manner in which a few half-Gothic details are worked into a Renaissance grouping. Indeed the Bolognese palaces form almost a type by themselves. One of the most interesting of them, though very modest in proportion and ornamentation, is that known as the Palazzo Isotani, one bay of the façade of which is shown on the sheet of sketches. The open arcade of the first-story is a feature common to nearly every street front in the city. The palace is built of brick of a medium tone, the ornamental portions being of light stone. The slight hood-moulding over the window heads terminating in sharply-cut rosettes outside at top and bottom, is quite a marked feature of the work of this description found in Bologna, though not without Florentine precedent. The cornice is very delicately proportioned, with a few well-chosen lines of ornament. The figures in the niches are rather curiously chosen, consisting alternately of a vase, the head of a child, and that of an old man. And, finally, the sky-line is pleasingly fringed by the wavy line of the overhanging roof tiles.

There is another palace in much the same spirit as this, called, I know not why, the House of the Carracci. In this instance brick and terra-cotta only are used. The lower arcade is dispensed with. In its place is a plain basement, ten feet high and slightly battered, above which the entire building is carried out over the sidewalk, being borne by strong brick corbels and archings projecting about thirty inches. The windows of the main story are in detail like those of the Palazzo Isotani, while the cornice is somewhat higher, and has modillons in place of the row of niches. A scheme of color has been attempted here, which, while doubtless of quite modern origin, is pleasing in effect and accords well with the style of design. The basement, which is stuccoed smoothly, and presents almost an unbroken surface, is of a light ochre tone; the brick is painted a deep Indian red, dulled somewhat to prevent its being too staring, and all of the mouldings and ornamental details are a deep, rich chocolate color; the little wood-work showing at the windows is painted in black and dark red. Such a combination might not seem as happy in America as it does under the hot sunlight of Italy. Red is not usually called a soothing tone; but after one's eyes have been dazzled by the glare from the long rows of pale-yellow and dead-white stucco houses, it is a pleasant relief to come upon this bit of strong, dark color, for the light basement but makes the upper tones more pronounced and restful. The palace occupies a corner, and, like the Isotani, has but two stories, though a modern addition has been built up on one side. Few of the Bolognese private dwellings are over two stories in height.

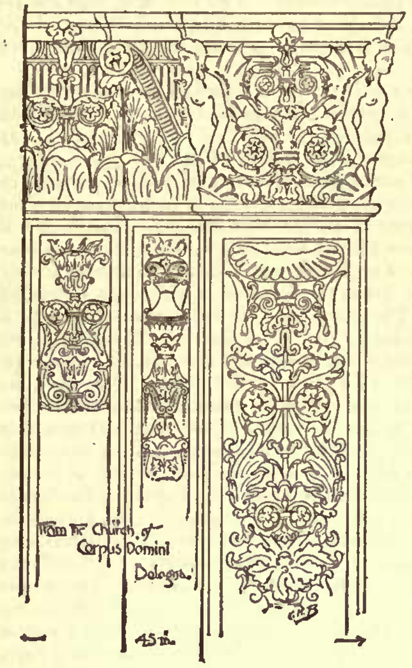
A more ambitious structure is the palace owned and occupied by the Bevilacqua family, a prominent name in the annals of North Italy. The design of this building is ascribed to Bramantino. It was erected somewhere about the latter half of the fifteenth century, and affords a very perfect example of the type of building which in arrangement of façade has proved such a source of inspiration to some of the best French architects of the present century. In scheme it is not unlike Dubaa's famous *hôtel* of the rue Tronchet, Paris, so dear to all good academicians. The Palazzo Bevilacqua is built entirely of stone. The base-course takes the form of a wide seat extended across the entire front. The *porte cochère* is at one side, with a smaller entrance correspondingly placed on the left. Between these are the windows of the lower floor, which are quite small and set up eleven feet from the ground, with plain square heads. The windows of the main story are of the same type as those of the Palazzo Isotani, but larger and much richer in detail. Over the entrance is a bold little balcony with fine, lace-like wrought-iron railing very delicately designed. A heavy cornice not unlike that of the Riccardi Palace in Florence, extends unbroken across the façade. The street front is eighty feet or more long, and not over forty-five feet high. The long, low effect is increased by marked horizontal bands, one below the lower windows, and a broad string-course at line of the main floor, while there are no continuous vertical lines. The stone-work is arranged differently in each of the three horizontal divisions. The courses are about twelve inches high throughout. In the lowest division the blocks are nearly square with widely-channeled joints, rounded edges and faces projecting one inch, but left flat, with diagonal lines cut across them. In the next division the stones are oblong, with wide, sunk joints and faces sharply bevelled all around. The blocks of the upper story are square, with flatly-bevelled faces and wide, square-cut joints. Doubtless much of this heavy jointing is mere cut work and the actual stones are larger than the channeling would indicate, but the effect is none the less honest and stone-like. Indeed, notwithstanding the richness of the details and the multiplicity of small parts, the appearance of the whole is by no means fussy or overloaded, while there is a simple directness in the way one or two difficulties have been met and overcome, and a sense of fitness about the decorative members which make the building well worthy of most careful study.

The court-yard of this palace is also quite noticeable. It is ascribed to Gasparo Nadi, whoever he may have been, and is enclosed by a double arcade, not managed, perhaps, with the niceity of feeling for proportion which marks the façade. The arcades are very good, each by itself, but it hardly seems best to put over one series of columns and arches a second row which is almost exactly half its size, member for member, and then to crown the whole by a cornice which is proportioned neither to the upper division nor to the total height. Still, criticism aside, the effect of the double arcade is very pleasing, however irrational it may be in design. It is one of those cases where the whole is far more satisfactory than any of its parts, and after all, good general ideas are usually the most successful, even if they do not bear criticism. The Palazzo Fava, in another part of the city, has a court-yard, in which the same *motif* has been utilized, though in a more satisfactory manner, the smaller arcade in this instance seeming more like an open portion of the upper wall, and not like a crowning division. Here, too, the arcade does not extend entirely around the court, but unites with the boldly-constructed balcony to form the picturesque corner shown in the sketch. This balcony with its long, richly-carved brackets looks as though it might have given an inspiration to the designer of the west front of the South Kensington Museum at London, where there is a long, external gallery of much the same description, though executed, I believe, in terra-cotta.

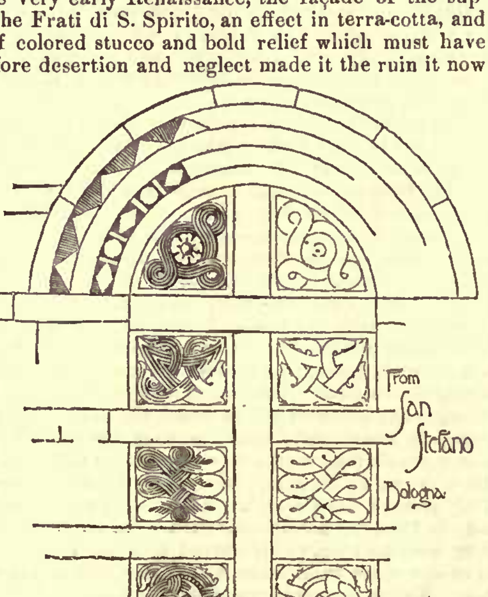
San Petronio is not the only example of the aspiring tendency of the Bolognese, nor indeed of their failure to properly plan from the beginning. Near the centre of the city is a tall, ungainly brick tower, resembling the ugliest type of factory chimney, but which was the pride and delight of the local artists of the sixteenth century, if we may judge thereof by the number of times it is found represented in their paintings. It was erected in 1109, and bears the name of *Torre Asinelli* from the name of its builders, though malicious enemies of Bologna have said the name referred to the long-eared tendency which the people have at times manifested. It is three hundred and twenty feet high, and leans four feet out of the perpendicular, but being very slender in proportions and diminished towards the top, it seems much higher than it really is. Immediately adjoining

it is a second tower, probably the only one of the many Italian structures of its kind whose obliquity was intentional, for though only one hundred and sixty-three feet high, it is ten feet out of perpendicular; less than the tower of Pisa, but more dangerous looking, as it is a plain, square brick stump, with neither base nor anything to finish the top. It is a pity the tower was not carried to completion, as it would have afforded an excellent opportunity of knowing just how far a tower can settle out of plumb and still be secure, for the Bolognese would undoubtedly have kept at it until it tumbled down about their heads.

There are quite a number of interesting churches in Bologna. Of San Pietro, the Cathedral, I heard such discouraging reports, I never went inside, though while passing on the way to the railway station I caught a glimpse of a showy, theatrical interior, quite Jesuitical in character, which satisfied without further investigation. The cathedral has, however, a good campanile dating probably from before 1500; a simple, straight-forward piece of brick construction.

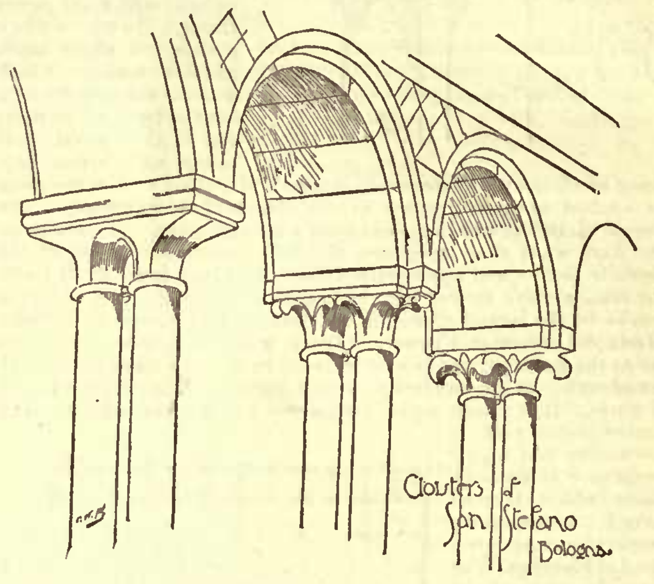


Among the small churches one finds occasionally some good things not mentioned in the guide-book, which will repay the trouble of hunting them up. The Church of the Corpus Domini, for instance, has a richly-carved eastern portal in the Lombard Romanesque style. It has been pretty badly used by time, but has happily escaped the hand of the ruthless restorer, being in an obscure, out-of-the-way street. It is in sufficiently good order to show the fanciful, exuberant carvings of the door posts, and the rich, effective mouldings of the cornice. It is rather interesting in this connection to note that the finish of the arched door-head here is much the same as that about the windows of the two palaces first described; that is, there is the same slight hood-mould, and the sharply-cut outside rosettes at top and bottom. Near this church is a little gem of the very early Renaissance, the façade of the suppressed chapel of the Frati di S. Spirito, an effect in terra-cotta, and a few bright bits of colored stucco and bold relief which must have been charming before desertion and neglect made it the ruin it now is. The design is very simple; a central doorway, a blank window on each side filled with strong-colored frescoes, above a row of short pilasters, alternated with medallion figures in high relief on colored grounds, and a rich cornice and low gable over all. A spirited restoration of this front was made by one of the *Grand Prix de Rome* men a few years since.



San Domenico is externally a Romanesque church, though the interior was completely remodelled during the last century, and all antiquity driven out. It is notable principally as containing the tomb of St. Dominic, richly embellished with reliefs by Niccolo Pisano or some of his immediate pupils; a very spirited, artistic work. Two of the figures crowning it were by Michael Angelo. In the left transept is a monument by Francesco di Simone, dating from 1477, erected to a certain Alessandro Tartagni. The sheet of sketches shows a bit of detail from the casket.

In the eastern part of the city is a church, or more properly an assemblage of seven distinct churches, all connected and bearing the common name of San Stefano. It is an interesting pile, and if one can only give the snuffy old sacristan the slip, and get started alone, it is very entertaining to wander about among the different edifices. First there is a barn-like structure dating from 1637. Opening from it is the old baptistery erected some nine hundred years ago, now known as San Sepolcro, and containing an old tomb imitated from the Holy Sepulchre of Jerusalem, an ambon with some curious ninth-century carvings, and a few interesting bits of Romanesque work. Then follows a half-modern atrium and a ninth-century basilica; and after rambling about through dim crypts, and past crumbling monuments of decayed sanctity, one finally comes into a quiet, secluded little cloister of the thirteenth century, with broad arches and stumpy columns around on the ground level, and a light arcade above borne by coupled shafts. In the centre of the cloister is a patch of green grass, and a picturesque stone well, curb and canopy. It is just the place to go to on a warm sunny afternoon, and sit comfortably in the shade, sketching from the old Romanesque capitals, and wondering why in the world any one should say that architecture is a hard profession. As a whole San Stefano is hopelessly mixed and confused,

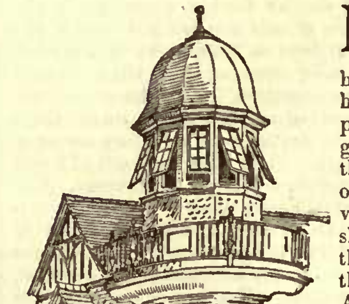


but it has a great many interesting and valuable bits of detail, if one will but search for them; and there is such a delightful air of mellow antiquity about the church and its many edifices that time spent there is sure to pass quickly and pleasantly.

This is not all of which Bologna can boast. She has her University nearly eight hundred years old, which during the thirteenth century numbered as many as ten thousand pupils, though now there are barely four hundred. And her *Academia delle Belle Arti* with *the* St. Cecilia, Raphael's heavenly musician, and other paintings, less famous, by Guido Reni, Domenichino, Carracci, and the school of artists who did so much to keep art alive after it had died out in Rome. Bologna is a city which grows on one, and there is hardly a quarter which does not prove possessor of some piece of art work worthy of notice, or some little out-of-the-way palace or convent church which repays study.

C. H. Blackall.

HOW TO CARE FOR OUR POOR FELLOW-CITIZENS.[1]



FOR those persons who like to trace the development of the moral impulses which belong to successive periods of history, there could hardly be a pleasanter study than that of the growth, during the last two or three decades, of the sentiment of sympathy for the trials and privations of the very poor which shows itself in earnest and thoughtful efforts to ameliorate them in the most judicious way. Although an infinite amount of work for this end remains to be done, a great step has been gained in diffusing a knowledge of the spirit in which that work should be carried on, to avoid injury to those for whose benefit it is intended; and all those intelligent persons who sincerely wish to make the lives of a few of their fellow

[1] *L'Economiste Pratique. Construction et Organisation des Crèches, Salles d'Asile, Ecoles, Habitations Ouvrières et Maisons d'Employés, Hôtels pour Célibataires, Cuisines Economiques, Bains, Lavoirs, Cercles Populaires, Nourriceries, Maternités, Dispensaires, Hôpitaux, Hospices, Asiles de Nuit, Postes de Secours.* Par Emile Cacheux. Paris: Baudry et Cie., 15, Rue des Saints Pères, 1885. Price, 40 francs.

men happier than they would have been without their aid, have now a general idea of the mode in which their benevolent impulses should be carried into effect. Unfortunately, in most cases it is only a general idea, the particulars derived from the study of the results of previous experiments of the kind being rarely known outside of the limited circle of persons immediately concerned; and for want of these particulars a great deal of charitable work is done to little or no purpose, which might have been far better directed if the means had been at hand for studying the experience of others in similar work. Nearly every one who has interested himself in any philanthropic movement has felt the need of such information, and several efforts have been recently made to supply it by means of a class of books among which the one before us stands preëminent, both for the extent of the ground which it covers and the thoroughness with which examples of as many different kinds as possible are collated and described.

The author of the work is a professional man of considerable distinction, who, as we learn incidentally from the text, came into possession of a property, much of which was invested in tenements for poor people. With characteristic energy and good feeling, he undertook to make himself acquainted with his tenants and their homes, and, so far as possible, to use his superior knowledge in promoting their health and comfort; and later, through his study of their lives, he was led to consider seriously the whole problem of the amelioration of the condition of the class to which they belonged. As a preliminary to an attempt at the partial resolution of this problem he gathered together all the information within his reach in regard to what had been done in France and other countries in the way of constructing improved dwellings for working people, of forming building and other coöperative associations among them, of establishing clubs for amusement and instruction, and of building and managing hospitals, schools, and asylums of all kinds.

This theoretical study was followed by practical essays at constructing improved dwellings, and at forming coöperative associations, and the history of these attempts is combined with a clear and concise presentation of the information on the subject collected from the most diverse sources, to form a book of the greatest interest and value, not only to the students and practitioners of benevolence on a large scale, but to architects and sanitarians, who are often called upon to provide designs for such establishments as those of which M. Cacheux treats, but find it difficult to collect examples upon which their studies may be based.

The writer begins his work with an introduction so forcible and intelligent that we are tempted to translate it in full, but it would be fairer to him to leave that pleasure to his own readers, and we will content ourselves with quoting his encouraging expression of his belief that although the number of the wretchedly poor does not sensibly diminish in most civilized countries, and although ninety thousand people die every year in France of want, nevertheless, the enlightened efforts of the past twenty years have begun to show some fruit, and while in England, or at least in London, the number of registered paupers is now materially lessening, in France, mainly through the influence of M. Godin and various other chiefs of great industrial establishments, the lot of poor working people has been ameliorated in a different way, and those who are willing to live industriously and virtuously may now in that country in many cases look forward to a future of comfort and security such as they could not have hoped for a few years ago.

Of course the whole science of modern philanthropy is now in the experimental stage, and it is fortunate that circumstances or individual inclination have led to great variety in the experiments which have been tried, so that, although no one of them has completely solved the problem to which it was applied, each has been the means of establishing principles and furnishing precedents to guide future efforts. The two extremes of philanthropic sentiment, as exhibited in practical effort, are perhaps best represented in the experiments at Guise and at Mulhouse. In the former town, M. Godin, a maker of stove castings, of a mildly socialistic turn of mind, but much real ability, undertook to gather his workmen around him in a vast coöperative housekeeping establishment, which he called a *familistère*, probably in imitation of Fourier's celebrated communistic *Phalanstère*. Living among his men, and exercising on them and their families, by his own force of mind rather than his position, an almost unlimited influence, M. Godin was soon led, as the size of his *familistère* increased with the extension of his business, to establish a set of rules for the government of his great household, which have proved extremely successful in securing industry and morality among the families which compose it, in providing for the care and education of children, and in promoting happiness and contentment. More recently he has added to the good influences by which he has surrounded his people an element of hope and legitimate ambition, by providing for the participation of his workmen in the profits of the business which they help to carry on. Like the most judicious of the other French manufacturers who have adopted this principle, he encourages the men to invest their savings as capital in the establishment, and so generally is this done, and so rapidly do small savings aggregate into considerable sums, that the business will, it is said, before many years virtually belong to the persons who, if they are willing to exercise a little more forethought and discretion than most workmen show, are best fitted by their knowledge of its details to carry it on successfully.

Although M. Godin's scheme has worked successfully at Guise, there is a certain flavor of sentimentalism about the idea which perhaps adapts it better to Frenchmen than to workingmen of Saxon descent, whose tastes seem to have been better suited by the more prosaic, though equally admirable provisions by which the manufacturers of the Alsatian town of Mulhouse have brought so much happiness and contentment to their poorer fellows. At Guise all is vast; interests, amusements and occupations are all in common, and on a great scale; while at Mulhouse the individual becomes prominent, and the science of securing happiness with sixpences is the one which is taught there, perhaps better than anywhere else in the world. At the very birth of the young Alsatian workingman, his comfort is provided for by a sort of baby-insurance system, under which all the young married women employed in the mills are encouraged to pay a small regular sum into a fund, out of which, when a baby is born, a salary of eight dollars a month, as a substitute for the wages she would lose, is paid to the mother for three months, on condition that she stays at home during that time and nurses and cares for her child. When the baby is old enough, excellent schools are ready for him; and even after he has begun work in the factory, evening schools and industrial museums give him technical instruction, from the rudiments to the highest grade. In later years, domestic life is made as easy and comfortable as possible. Pleasant and well-planned houses are to be hired at a reasonable rent, and the tenant who pays his rent regularly for fourteen years then becomes the absolute proprietor of his house. This provision tends strongly to fix families in their homes, and makes it possible to establish in various localities those coöperative stores, bakeries and restaurants which prosper so well in communities where all the members are known to each other, and usually fail so miserably where they have to depend upon a shifting population. To encourage hope and zeal in the operatives, the system of participation in profits is carried out very generally, in ways differing according to circumstances or the fancy of those who have established it in each case; and insurance of all sorts, against accidents, fire, strikes, sickness, old age, infirmity and death, can be had at low rates, while well-organized charitable societies, dividing the city into districts, after the fashion of our best associations of the kind, find out and help those whom unavoidable calamity has made dependent upon the good offices of their fellow men. So thoroughly is this work done, and so generally is the habit of modest thrift diffused in the community, that even the terrible war of 1870, which raged about the city, and ended in the conquest of the province in which it is situated, caused no permanent injury to the manufacturing interests of the place, and not even temporary suffering from actual want to any of the forty thousand operatives employed there. It is impossible to read of this without lamenting, as M. Cacheux does, that the principles of practical benevolence followed at Mulhouse should not be adopted in larger cities. In Paris particularly, as he says, although those who have money are generous in giving it for what they call charity, they trouble themselves very little about the way in which it is distributed; and the result is, as has been established by investigations made with the lists of persons receiving aid from benevolent societies in the hand of the inspector, that ninety-eight per cent of the names on the lists are those of able-bodied drones, thieves and swindlers, and that only two out of every hundred, on an average, are those of persons who really need assistance. Of course there are always, in every large city, sick and helpless people enough to employ with advantage all the resources that the most profuse benevolence can furnish, but these people are almost always too young, too modest, or too proud to apply for help, and as the benevolent societies are not energetic enough to hunt them out, the charity intended for them is appropriated by the gamblers and tramps who besiege such societies with their impudent fictions.

We have delayed a little over these introductory remarks of our author, partly to show how thoroughly he understands what is the object to be aimed at in spending money for the good of the poor, and partly for the sake of suggesting concisely the lesson which the author constantly teaches in his book, in ways which we shall not here be able to follow; and can only briefly notice the most interesting of the practical chapters, in which the author narrates his own experiences in building workingmen's houses in Paris.

His visits to the five hundred families occupying the buildings which he had acquired, just before his studies in social science began, having shown him the unwholesomeness of the conditions under which they lived, he began his efforts to ameliorate these conditions by visiting, as he says, several thousand workingmen's dwellings in Paris, and found that in nearly all, as in his own, their occupants were lodged in a manner "quite incompatible with the laws of morality or hygiene." Not one tenement out of ten comprised three rooms besides the kitchen, and thousands of them consisted of one room for all purposes; while, as the statistician of the Government informed him, half the workingmen's families in Paris included more than four persons. The consequence of crowding families into such insufficient space he found to be serious. In the first place the father of the family, annoyed by the confusion about him at home, was driven to spend his evenings outside, usually at the wine-shop, where he squandered both his earnings and his health, while the women and children, who remained in the house, suffered not only from the closeness and confusion, but still more from the smells of the cooking, washing, and drying of dirty clothes before the fire, which, as some of them must, in such narrow quarters, sleep in the kitchen, they could not avoid. In the second place, with all but the smallest

families, it was necessary for several persons, often of different sexes, to sleep in the same room, at the risk of their morals in any case, and at the risk of their lives, also, if a serious epidemic should break out in the neighborhood.

Convinced that overcrowding was the evil to be first attacked, M. Cacheux betook himself to the study of plans and modes of construction by which poor people could be furnished with proper accommodation, at the same price that they had been paying for insufficient room. In this investigation he spent three years, aided by experts of high reputation, and after publishing the results of his study in a book on Workingmen's Dwellings in All Countries, which gained immediately the highest commendation from officials and benevolent societies, he proceeded to apply the knowledge he had gained to his Parisian problem. There have been several competitions in Paris, on various occasions, for plans for workingmen's houses, and, not venturing to be his own architect, he requested three of the authors of plans which had received prizes to construct houses for him in different places. Only one responded to his invitation, and agreed with him to build a house, intended to cost six hundred dollars, for a commission of twenty per cent on the sum expended. The house cost twelve hundred dollars in place of six hundred, and was sold, including the land, for eighteen hundred dollars, paid in fifteen annual instalments, of one hundred and twenty dollars each. This, although not entirely unprofitable, was a less successful financial operation than the construction of some other houses, from plans given in the book, which cost eight hundred and eighty dollars each, without the land, or twelve hundred including land, fences and wells complete, and sold readily for eighteen hundred dollars, payable in fifteen instalments, as in the first case.

By these and other experiments the author was led to the conclusion that twelve hundred dollars was the least sum for which a detached house, containing three rooms besides the kitchen and outbuildings, could be had within the limits of Paris, including the price of the land. Something might, however, be saved both in land and in cost of construction by building houses contiguous, with party-walls between, and another essay was made by contracting for a block of ten houses, each of one story, comprising three rooms and kitchen, with a cellar, at seventy-two hundred dollars for the entire block. These houses, which were certainly cheap enough, were afterwards transferred at the cost price to a philanthropic building society, which sold them, including the land, the value of which would naturally have been considerably less than in the previous instances, at seventeen hundred and fifty-two dollars each, payable in twenty annual instalments. Other ventures of different kinds followed these, with the same general result, so that, as M. Cacheux says, out of about twenty different types of houses, containing from three to ten rooms, and costing from six hundred to three thousand dollars each, but all intended to be occupied by one family, there was not one that could not be sold on annual instalments at a price which would return five per cent interest on the investment, while the amount of each annual instalment was little greater than the bare rent which would have to be paid for the same accommodation in a tenement-house.

Unfortunately it is not always easy to find cheap land within the boundaries of a great city, and those who wish to improve the condition of their poorer fellows are always brought, sooner or later, to the problem of housing them decently in large buildings, a problem which is rendered more difficult by the fact that clean and wholesome tenement-houses have to compete in rent with vile old rookeries, for which any price is a profit; and it is found in practice that more than three per cent interest can rarely be obtained from such property, carried on by the owner in any decent manner. One who is satisfied with this can, however, generally be sure of keeping his houses full of respectable and honest tenants, and is in a position, by making their tenure depend upon their conduct, to exercise a most salutary influence over them. Curiously enough, the worst enemy to be encountered in carrying on such efforts to do good appears to be public charity of the ordinary kind. M. Cacheux illustrates this in part by citing the case of two of his own tenants. One of these hired expensive rooms in the front of the building, with a view down the street. The family went often to the theatre, and the head of it always stayed away from his work on Mondays, to recover from the effects of his Sunday recreation. The rooms were always dirty and ill-kept, and the children neglected. A part of this tenant's rent was paid for him by a charitable society. The other tenant hired cheap rooms in the rear of the building, looking out on a court, but paid the rent himself. He and his wife worked hard, but they found time to keep their rooms clean and to bring up their children with tender and judicious care; while their neighbors in the front rooms were being encouraged in idleness and vice by the most effective means, under the name of charity. It is not wonderful that the poor, with such examples before them, have but a mean opinion of the justice of society, and learn to hate and despise that charity which seems to them to choose for its objects the persons who deserve it least. This feeling perhaps does something to strengthen the sentiment of independence, which is so strong, even among the poorest, that, as M. Cacheux says, it is difficult to find good tenants in Paris for the improved houses built professedly for a charitable purpose; the decent and self-respecting families preferring to pay the same rent in a common tenement-house, rather than put themselves, even in imagination, under obligation to philanthropists.

Beyond the promotion of a personal acquaintance and mutual good feeling between landlords and tenants, little progress has yet been made anywhere toward improving the condition of the very poor inhabitants of city tenements. A proper surveillance may prevent them from fleecing each other, as some of them, particularly the Irish, do most unmercifully; one house, of which M. Cacheux speaks, having been rented by the owner for one hundred and twenty-five dollars a year, to a tenant who sub-let it for two hundred and ninety dollars, in small tenements, to families who again rented single rooms and parts of rooms at rates which brought in six hundred dollars a year; but no one has yet shown how to build great tenement-houses which will, unless under exceptional circumstances, afford the poorest class of laborers and their families, at a rent which they can afford to pay, the comforts of a clean and respectable home, and at the same time pay a continuous interest of six per cent on the investment. M. Cacheux himself does not appear to see much promise in efforts to this end, but prefers, like most other experts, to encourage the construction of small, single houses, either through the medium of building societies, which, when managed as they are in England, he commends most warmly, or by the safer method of leaving the care of the first operations of purchasing land and constructing houses to prudent business men, who make sales on instalments at reasonable rates of interest, and thus, without losing anything themselves, teach and encourage their customers to take their affairs gradually into their own hands. This plan has actually been carried out with success by M. Cacheux and some of his friends, and the complete presentation of their scheme, with drawings of the houses built, and copies of their by-laws, leases, regulations for tenants and contracts, which are given in the book, is full of interest and instruction.

This, with some explanatory and illustrative matter, completes the first part of the book. The second part is devoted to methods and means of lightening the burdens of the poor in other ways than by improving their habitations, and includes the most practical and useful information possible about workingmen's restaurants and lodging-houses, nurseries, schools, public baths, laundries, hospitals of various kinds, clubs and banks for workingmen, tramps' lodging-houses, and so on. It would take too long even to indicate in the briefest manner the variety of documents, specifications, models of reports, regulations, statutes and statistics which are here collected, after a choice made with admirable judgment. It is true that they serve to give the pages of the book a dry, matter-of-fact look, which will probably repel the sentimental amateur of benevolence, who likes to feel himself gushing with sympathy over tales of woe, without the inconvenience of bringing his emotions to any practical result; but for people of action, who propose to do something for their fellow men, and wish to set about it to the best advantage, nothing could be more valuable than these detailed descriptions of the actual administration of charities similar to those which they desire to help in establishing. On the subject of day-nurseries alone, for instance, we find a hundred pages of information collected from France, England, Germany and Holland; while a still larger space is devoted to coöperative societies, savings-banks and insurance associations, including an abstract of the attempts which have been made in France to enable workmen to participate in the profits of the business which they help to carry on. It will be seen that although we have quoted pretty liberally — although not so liberally as we should have liked — from certain portions of this admirable book, there is plenty of matter left, to which we have not been able even to refer; and we quiet without difficulty the conscience which always reproaches us when we use the work of other people to give interest to our own, by the reflection that a more meagre account of the book would have given a very inadequate idea of what is a veritable encyclopædia for the benevolent.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

SKETCHES AT HINGHAM, MASS.

SKETCHES AT BOLOGNA, ITALY, BY MR. C. H. BLACKALL, ARCHITECT.

DRAWINGS OF THE CHURCH OF THE HOLY SPIRIT, AND OF THE CHURCH OF CORPUS DOMINI, BOLOGNA, ITALY.

For description of these three plates, see the article on Bologna elsewhere in this issue.

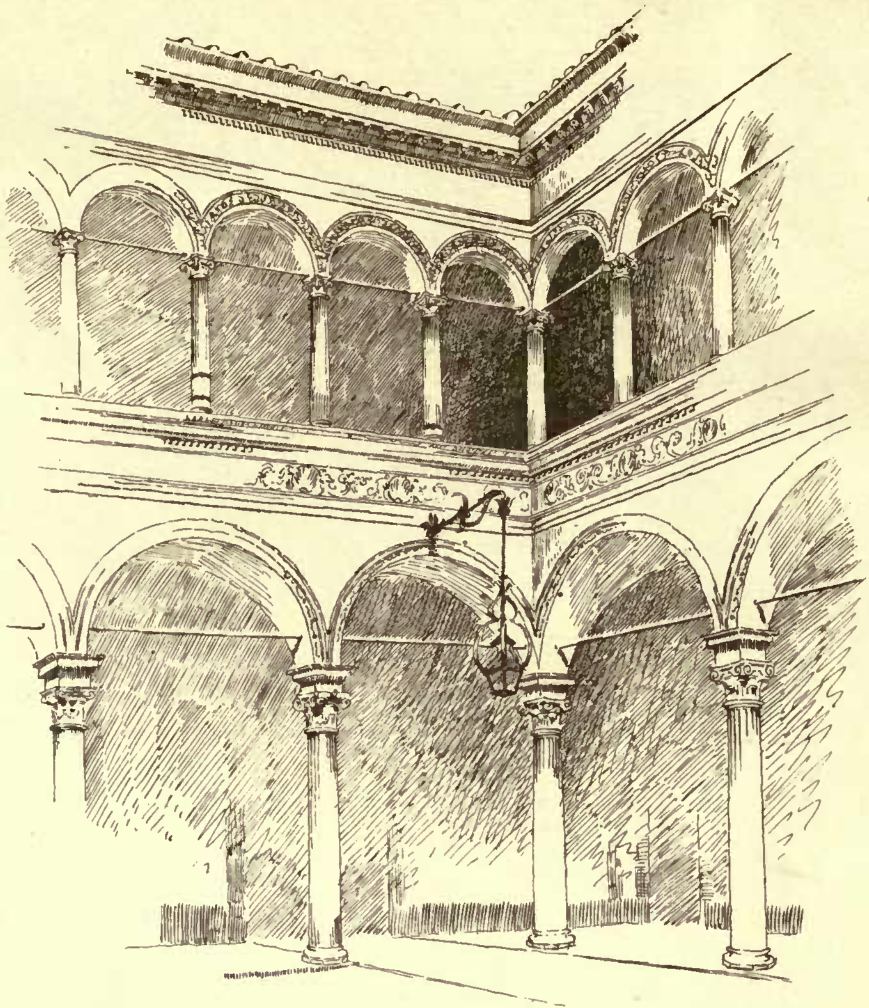
The New Quays at Antwerp.—The completion of the new quays at Antwerp form an epoch in the commercial history of that port. They are situated on the right bank of the Scheldt, and are over two miles in length. They were constructed at the expense partly of the State, partly of the Government, and cost over £4,000,000. This gigantic work has been entirely carried out by the well-known Paris contractors who constructed the Suez Canal, and are cutting the canal of Panama. The chief engineer is M. Loisseau. These enormous and costly works have been rendered necessary by the unprecedented increase of the commerce of Antwerp, which is now the first port of Continental Europe. The total tonnage of the sea-going shipping entering this port last year was nearly 4,000,000. — *The Iron Age.*



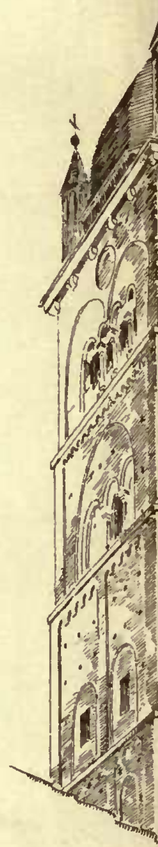
The Heliotype Printing Co. 211 Tremont St. Boston.

Doorway: Corpus Domini Church. Bologna Italy.

AMERICAN ARCHITECT AN
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Palazzo Bevilacqua



Tower of San Pietro

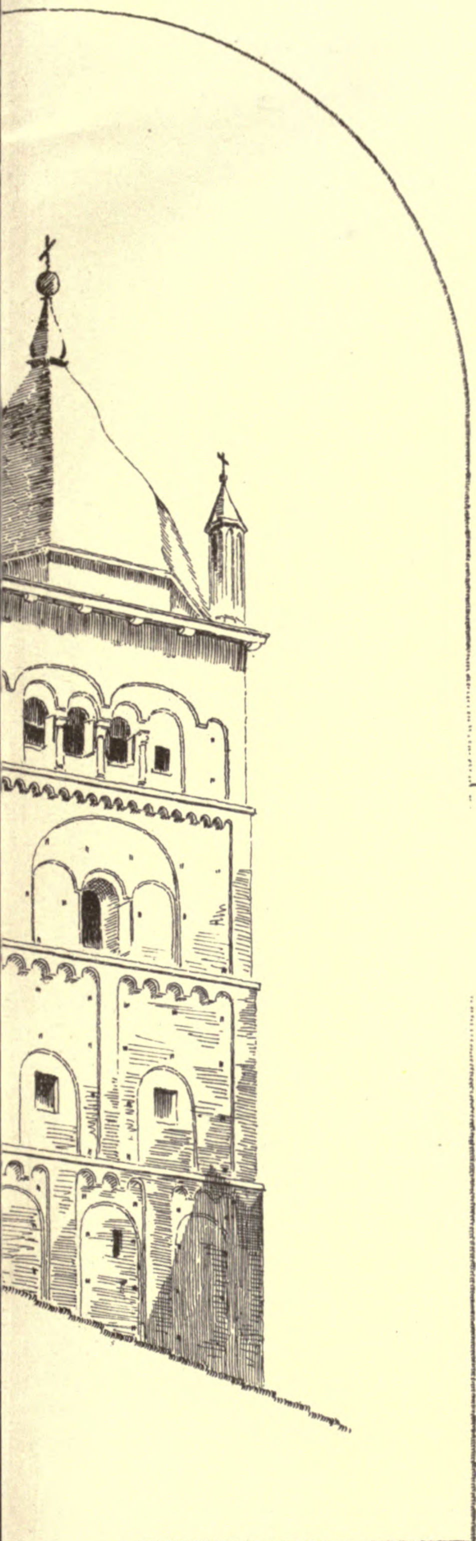


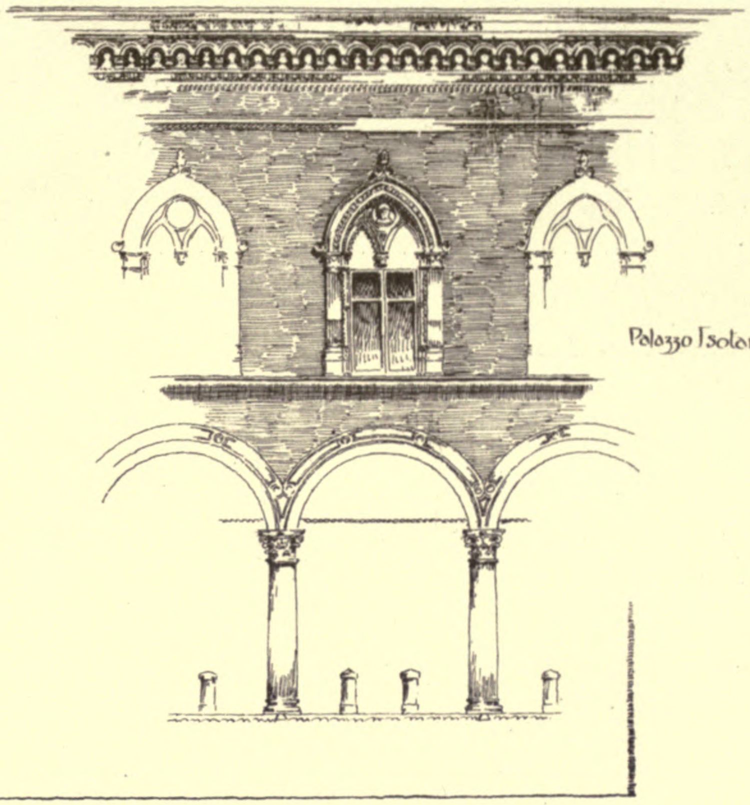
From base of
Monument of
Alessandro Tartagni
San Domenico.

Sketches from Bologna-Ita

by C.H.Blacka

ES R OSGOOD & CO





Palazzo Isolani.



Palazzo Fava.

7.

HELIOTYPE PRINTING CO. BOSTON



The First Church built 1681.



Porch of the old

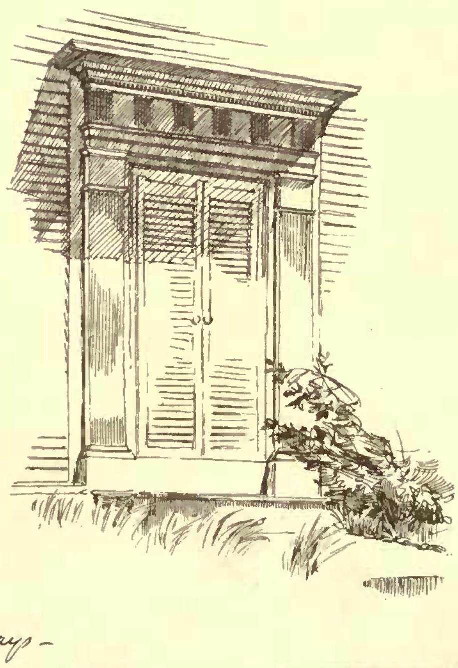




Typical Cottages in and around Hingham.



Bate 1804.

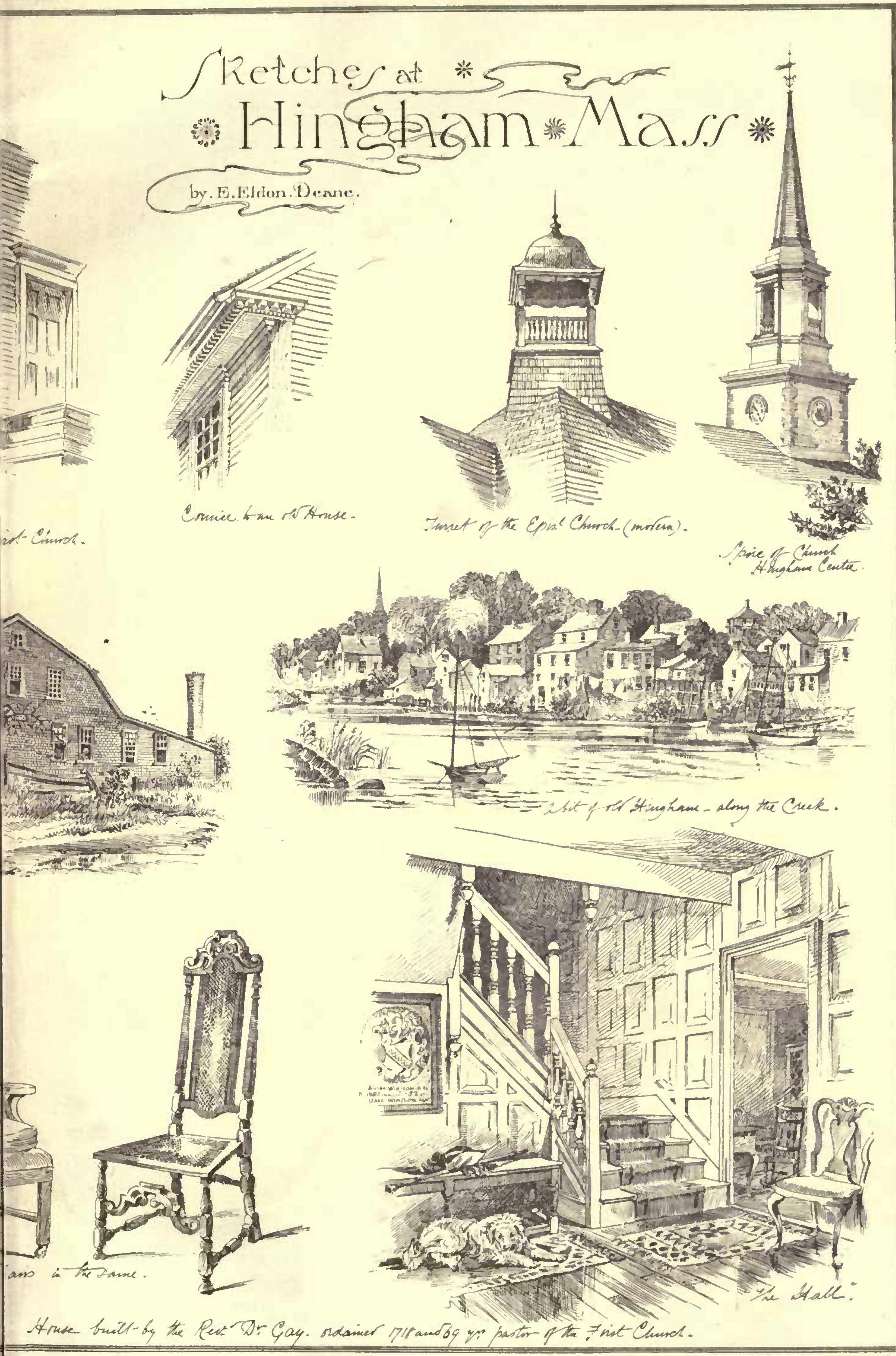




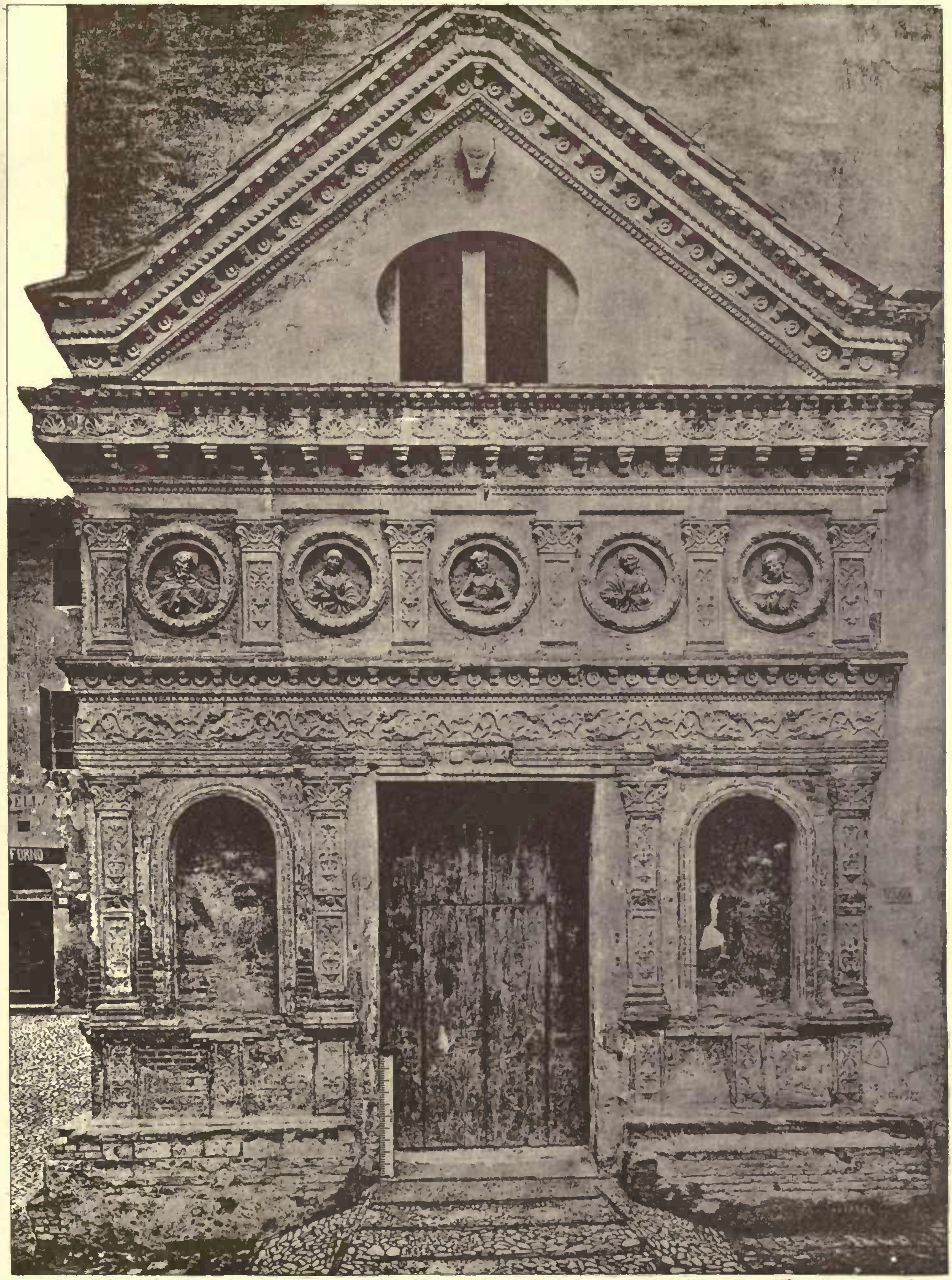
old

Old Doorways.

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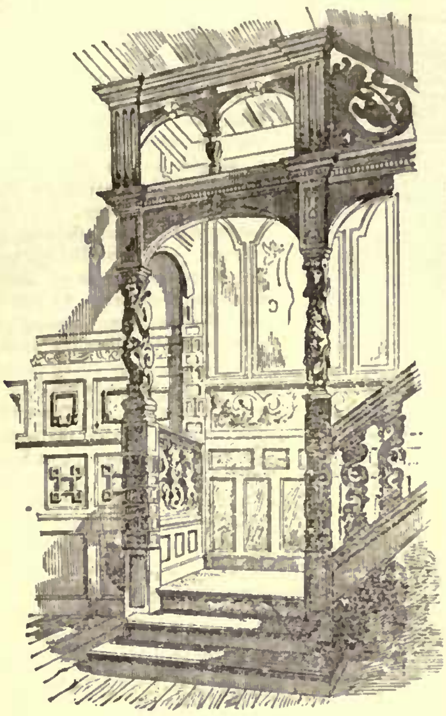
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Doorway: Church of the Holy Spirit, Bologna, Italy.

FRENCH ARCHITECTURE IN THE NINETEENTH CENTURY.[1]—III.



DURING the second empire, the mediæval movement, though confined to a comparatively small number of architects and archæologists, continued to gain strength. Restorations of Notre Dame of Paris, of the Cathedrals of Amiens and Laon, of the Abbey of Saint Denis, of the church and fortifications of Carcassonne and many other important monuments were undertaken under the charge of M. Viollet-le-Duc; and the general interest in the subject led to the appointment of innumerable diocesan architects who, with more or less success, have restored the most of the important old churches of the country. Fortunately, during the last generations these monuments had been, in general, rather neglected than revised, and it was not until mediæval art began to be intelligently studied that restorations were taken in hand; so that France has been spared most of the ravages which England suffered at the hands of Wyatt and other later and perhaps less pardonable restorers. What the religious wars and the war of the Revolution against all religion had spared to France has remained for the most part without serious harm to our day, and the late restorations have generally been carried on with skill and with a fair appreciation of the style of the buildings. Yet the traveller who wishes to trace out historical points with accuracy, or to yield himself to the naïve charm of the early work, is often a good deal disconcerted at the natty spruceness with which some venerable old monuments have been polished up, and most disagreeably of all perhaps at the hard net-work of black mortar with which the fair white stone has been pitilessly marked over, as if it were ruled off with a gigantic carpenter's lead-pencil. It is worth mentioning, that, led by M. Viollet-le-Duc, who was in great favor with the Emperor at that time, the mediævalists, opposing the academic influence of the Institute, made a vigorous attack upon the Ecole des Beaux-Arts, and succeeded in obtaining in 1863 a decree, remodelling the constitutions of the school, and appointing among others M. Viollet-le-Duc himself to a prominent chair. But the traditions of the place were too strong; the students utterly refused to submit to the new order of things, or even to listen to a word of the lectures of M. Viollet-le-Duc, so that the Emperor, after a short and half-hearted trial, gave up the effort, and restored the school to its old basis. M. Viollet-le-Duc and those who were interested with him then established the Ecole Centrale d'Architecture, where the course of instruction was in method radically different from that at the older school, giving great prominence to the study of construction, and in general giving to constructional and practical adaptation the determining influence in the course of design, rather than, as in the Beaux-Arts, teaching first a monumental habit of composition and afterwards adapting it to the necessary problems. The influence of this school, or of the men who are working with it and its instructors, has at least been wholesome as a counterpoise to the formal tendency of the established system, and if it accomplished nothing more conspicuous, it perhaps did something analogous to what Dr. Holmes shrewdly ascribes to the homœopathic physicians, when he says that they have scourged the regular practice into reason. But the Ecole des Beaux-Arts and its traditions were too well grounded in public favor to be displaced. The Ecole Centrale, after struggling for a few years in ineffectual rivalry, settled down into subordination and became little more than a preparatory department to the older school.

The public buildings built under mediæval inspiration in France are not many nor very noteworthy. The Hôtel de Ville of Angoulême, by M. Abadie, is as characteristic as any, perhaps, a good example of the French tendency to eclecticism at this day, and of their fundamental desire after all to do things their own way. It is noticeable that not only is it through the Byzantinized Romanesque in France that the Neo-Grec and quasi-Classical party show themselves most affected by the mediævalists, but it is in their Romanesque, and especially in their Byzantine reproductions, that the mediævalists themselves are most successful.

The French have not, except momentarily and at rare intervals, forgotten, as other nations have, the radical difference between Christian and Pagan forms, the appropriateness of the one both in expression and use to their Romish worship, and the unsuitableness of the other. Here on the whole, the mediævalists have had the best of it; and though modern church-building has not been very successful in France, yet unquestionably the most successful attempts are those which more carefully follow out the mediæval styles. The most conspicuous whole example of a pointed Gothic church is perhaps St. Clothilde of Paris, which, Gothic in form and reasonably near it in detail, is cold in feeling and formally symmetrical to a degree that kills the Gothicism out of it. M. Viollet-le-Duc's work in restoration and in building the new sacristy at Notre Dame, of Paris, is more successful: his works, the buildings from his original designs, of which we have not many, are less happy than his restorations.

The little church of Notre Dame de la Garde, which stands picturesquely on the summit of a steep hill overlooking Marseilles, is a charming instance of what the French have done under the Byzantine influence. Below, on the seashore, MM. Duc and Vaudoyer have been building a great cathedral, for which, moved apparently by the traditions of the region, their sense of the inapplicability of Classical forms, and their abiding preference for the Greek elements in architecture, they have also chosen a Byzantine style, more or less pure.

I have said that the French realize the special fitness of the forms of churches invented by the Church for the use of the Church, and it is very rare to see a church designed by a Frenchman in these days, which is not based on these forms. Whatever the details, Classical, Renaissance or modern Italian, Greek or Saracenic, which they lay under contribution, the typical arrangement of nave, aisles, clerestory and transepts are preserved or at least suggested. The published projects for churches are many, but very few incline one to wish them built. Of the French adherence to Christian forms already mentioned, the two most notable new churches in Paris, St. Augustine and the Trinité, are good examples. Both are mediæval in plan and arrangement; both are cleverly composed, with some elegance of detail; and neither seems church-like. The Trinité is to me in spirit especially secular and distasteful. I can find in it no trace of religious feeling, of reverence, or even of solemnity.

In funeral monuments, on the other hand, the French have done some of their most characteristic and successful work. It is a work to which their Classic and especially their Greek sympathies lend themselves well. Of two of their large monuments, the Arc de l'Etoile and the Colonne de Juillet, I have spoken. Their small cemetery monuments and tombs are full of invention and fancy, and generally show an agreeable sentiment, if no very deep feeling. They have furnished the type for many foreigners. The famous Lycian tomb in the British Museum, which attracted so much attention in its first discovery, suggested the model for many of them. I have a drawing of another tomb described in Texier's "*Asie Mineure*," which is so like a modern French monument, such as you may find in Pére Lachaise, that it is worth notice. It will be found to be composed of many details which are in use all through French architecture.

None of the works of the modern French show the vigor and freedom of their invention when untrammelled better than their markets. Of these the most notable are the Halles Centrales, or great general markets of Paris, built by Baltard. They cover four blocks, being pierced by two streets at right-angles, through which the public traffic goes on undisturbed. The whole exterior consists of a frame of iron columns supporting an iron roof. The lower part of this frame is walled-in solidly in brick, high enough to give a firm back to the stalls, above which the upper two-thirds of the wall are in iron panels and blind-work. The roof is of iron and glass, framed and supported in the most straightforward manner, and the whole form is simply developed from the natural uses of the building and the character of its material, with a little of the appropriate ornament which the French can apply so well when they have something well-defined to apply it to. The success of this building and the admiration it excited led to the building of others like it in form.

In a similar spirit are designed their railway stations, straightforward structures of masonry and iron, whose decided and often grand forms, simply determined by the uses to which they are to be put, are among the most characteristic of modern French work. Both the Strasburg Station and the St. Lazare or Havre Station in Paris, are examples of the troubles into which the French are often led by their inveterate habit of fixing all their designs by geometrical elevations, to the neglect of perspective studies. They both offer in front a recessed centre between advancing wings; that in the Strasburg station crowned by a grand gable with an immense semicircular window. In both the designs undoubtedly were effective; in both the recession of the centre throws the wings high above it in perspective, and the effect is that of two equal and divided masses of building, connected by an inferior centre. A perspective study would at once have taught the architects to give such preponderance in height to the central mass as to secure them against this disaster.

The French have succeeded well in their theatres, as was to be expected. The theatres of Schinkel and Semper in Germany, built before the second empire, had prepared the way for a more rational design by seizing upon and making to tell in the exterior the salient points in the interior arrangement. The French have not been slow to see the value of this treatment, and their recent theatres designed and erected show the use of it. The Théatre Lyrique and the Chatelêt, on the Place du Chatelêt in Paris, are characteristic examples

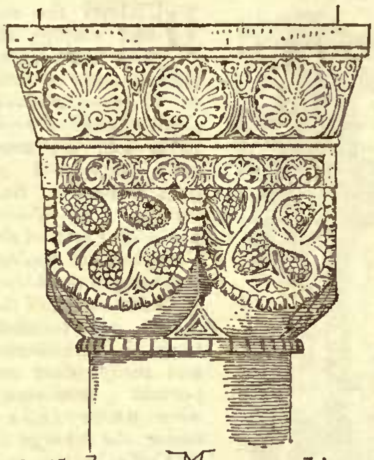
[1] Continued from page 79, No. 503.

of the more refined style of the empire, and show distinct traces of Neo-Grec influence. The new Opera, however, is their crowning work in this department, and is on the whole a favorable specimen of the exuberance of imperial architecture. It is an enormous building, very carefully and skilfully planned for its purpose, and with the exterior modelled very naturally upon its interior arrangement. The stage, the auditorium, the entrance pavilions, the lobbies and drawing-room, and the apartments behind the stage are all simply and faithfully indicated in the exterior arrangement. The exterior is sumptuous in adornment, with a freedom and brilliancy of detail, a certain classically-regulated caprice in ornament, which has its fascination and suits with the purpose of the building. The enormous proportion which the stage, and more especially the drawing-rooms, corridors and entrances bear to the auditorium is one of its noticeable peculiarities. Unfortunately it, too, suffers perspectively in the near view. In its most conspicuous aspect only its vestibule and loggia are visible. Just as the dome of St. Peter's is hidden from the front by the enormous projection of the nave, so here the throwing forward of the lower member of the building containing the huge staircases, drawing-rooms, etc., effectually hides from the neighboring boulevard the higher and predominating masses which cover the stage and the auditorium. Fortunately the opera is visible on all sides and surrounded by important thoroughfares, and this defect in the front view is made up for by many picturesque aspects in other directions. The front is marred in effect by a very heavy attic, which indeed is a characteristic of the whole exterior, carried on apparently inadequate supports. The screens and colonnettes which occupy the wide intercolumniations, being very different in color from the mass of the façade, do not add to its appearance of support in the execution as they doubtless did in the design. When it comes to the expression produced by detail, we can perhaps allow that a theatre be theatrical, that is, showy and covered with ornament to a degree that would overload any other building. Yet the profusion with which the ornament is showered on the Paris Opera-house, its exaggerated vivacity, and the obtrusiveness with which it is displayed, seem to more than half justify the caricaturist who placarded his pictures of it with "*Gare les lyres*," "*Gare les bustes*," "*Gare les pointes*." "*Gare les Apollon*," etc. With all the elegance that M. Garnier, himself a "*Grand Prix de Rome*," has known how to give his detail, its odor is of the elegance of the *parfumeur*, and is more suggestive of the Parisian demi-monde than of the honester *habitués* of the Opera.

In conclusion it may be said that the French, of all modern nations, have come nearest to the invention, or development rather, of a style; for the so-called Victorian style was a style revived and modified, not here now produced for the first time. But in French architecture we see distinct forms which have not been used in the world before, which yet are sufficiently individual to be recognized wherever we see them. Their detail, it is true, is gathered from all lands under the sun, and hard as it might have seemed to fuse all the mass and unite it well into a consistent whole, their power of assimilating and harmonizing is such that they have succeeded fairly well in making everything keep its place. The greatest difficulty which they have taken in hand is the difficulty of all nations addicted to Classical forms, from the Romans down — the old problem of uniting the Classical orders with the arch. The Romans held the arch and the order together by main strength. The Romanesque builders gradually abandoned the order. The Renaissance architects simply followed the Romans. The French have essayed the problem in their own way; they have emancipated themselves from the interposition of the entablature between the column and the arch, and the examples of twelfth-century work have taught them some good lessons in the feasibility of using arches of greater size in proportion to the order than the Roman or pure styles admitted. The introduction of grand arches filling the whole height of a column or a story is one of the distinctive features of modern French work. The entrance of the Palais de l'Industrie is a good example. The amalgamation may not yet be complete. In fact the license of to-day seems to be leading their architects astray from the defined path in which a few years ago they seemed to be moving. Their architecture to-day is eclectic, uncertain, variable; but it is recognizable wherever it is seen. When the architecture of this century is far enough in the past to be viewed comprehensively from a distance, and without contemporary prejudices, if a style is to be found in it, it will probably be that of France in the generation of Louis Phillipe and Napoleon III. L.

Overcrowding in the Campagna.—The Campagna of Rome, which suggests enormous space and few inhabitants, presents one of the most remarkable examples of overcrowding in Europe. In the suburbs of Rome it has been calculated that there are 1,048 houses for 9,748 occupants; but in the Campagna, with 12,734 inhabitants, there are only 556 [?] houses. The greater number of the laborers in the Campagna are strangers, who for the eight months dwell in huts or wigwams, in caves and grottoes, or in the ruins of ancient buildings and tombs, whilst many have no roof but the heavens and no bed but the grass. The scarcity of houses in proportion to the number of laborers is well-nigh incredible. In one commune there are 456 houses to 3,127 persons, in another 316 to 1,604 inhabitants, and in a third 704 peasants without a single dwelling! To render the anomaly more striking, there are places which contain many uninhabited houses. The entire province of Rome has 15,000 houses scattered over the country, with 110,000 occupants, and Grosseto has 3,265 houses for 25,202 persons. — *The Architect.*

A YEAR'S ARCHÆOLOGICAL RESEARCH BY THE GERMANS.—I.



Capital, from Marmontier, France.

So rich have been the yields of recent excavations in ancient soil that the Imperial Archæological Institute of Germany has been able to fill three stately volumes from the results of a single year's research.[1] Beautiful illustrations in fine outline engraving, life-like heliogravure, and delicately-colored chromo-lithograph brighten the pages of these works and continue to round out pleasantly archæological science which literary tradition, unaided by these monuments, conjures before us a mere skeleton. In Rome the excavations carried on by the Italian Government, in adapting the Eternal City to the more ambitious rôle she is now again to play, have thrown much light on buildings of her earlier day, when Augustus transformed the city of brick into one of marble. Well-trained archæologists have everywhere superintended these excavations. In reading Lanciani's vivid and thorough reports concerning the *portici*, there comes the conviction that nothing has escaped him on the earth, or under the earth, or even in the archives, which bears upon these prominent architectural features of ancient Rome, but which in modern Italian cities as Bologna and Padua, have dwindled into mere arcades over the sidewalks.

In the days of the Roman Republic *portici*, with their beautifully repeated columns and protected aisles were scarcely known, and the few that existed served the strictly practical purposes of business, being the centres for trade and collection of taxes. Rome was, indeed, early well supplied with delightful gardens and cool retreats for recreation in the Summer months, the whole of the Esquiline being a sumptuous park, interrupted only by tasteful villas. The slopes of the Janiculum and the region about the Pincio were also covered with shady walks and gardens. But during the winter months there was little protection offered for a people most prone to outdoor life. No doubt to the stern old Roman of the republican age massive architectural shelters from winter's chill would have seemed a luxury to be craved only by the effeminate. Besides, he looked with no favor upon the multiplication of works of art pouring in from Greece, all of which required asylum such as could best be offered by these spacious colonnades.

But with imperial Rome things had changed, and it was, as might be expected, the regal Augustus who first multiplied these hospitable structures, and that out of his own private means, persuading his friends and partisans at the same time to follow his example. That this new fashion soon became exceedingly popular appears from the fact that in the short space of twenty years these sheltering marble colonnades, embracing now sacred temples, and now rich collections of sculptures, covered with their stately complex the vast Campus Martius, that the pedestrian might pass from one end to the other, from north to south and from east to west beneath the aisles of the different *portici*. The poets, pre-eminently Martial, delight to dwell upon the delicious luxury of napping in midwinter under the shelter of these colonnades, the walls being built so that none of the sparse rays of the feeble sinking sun were ever lost. The *porticus* was, as a general rule, ten times as long as wide, and extending in straight lines for a long distance, required, by its very nature, an ample level for its development. It is therefore interesting to see how true the old architects were to the laws of style, for all the *portici* of Rome, with but two exceptions, occupied the only level surface in the city, viz., the plain lying between the hills and the great bend of the river, after it sweeps past Hadrian's Mausoleum, and circling around the Campus Martius, reaches the Island of St. Bartolomeo, just off the Ghetto.

On this Cistibertine plain, the *portici*, as recent excavations show, succeeded one another almost without interruption. They filled up all the space not occupied by theatres and race-courses, and numbered fully twenty, of which fourteen were in the IX Region of Augustan Rome. From these latter alone appears how regal was the extent of these porticos. There one could wander for a distance of 4,500 metres under shelter. They covered a surface of 100,000 square metres, and at least 2,000 columns supported the hospitable ceiling. These were of marble, often having gilded capitals, while the pavements were no less rich, being composed of variegated marble. In connection with two of these *portici* very remarkable discoveries have been made. The Portico of the Argonauts, with the temple of Neptune in its midst, has been revealed near the Pantheon. From the new discoveries it appears that the temple faced the east, and

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[1] "*Annali dell Instituto*," Vol. LV, with accompanying Monuments, in Vol. XI. "*Bullettino dell Instituto di Corrispondenza Archæologica.*" "*Mittheilungen des Deutschen Archäologischen Instituts in Athen.*" Achtu Jahrgang.

that very famous reliefs, which it has hitherto been impossible to place, decorated its stylobate directly under the outer columns. Full thirty-six metres of this sculptural decoration have been preserved, and represent subjects of which the Romans were very fond — symbolical figures of conquered provinces and trophies of war, consisting of the armor of the Roman and barbarian soldier artistically grouped. Three of these twelve figures of provinces preserved, but now widely scattered, were discovered in the days of Pope Paul III, and were taken to Naples; two came to light under Innocence X, and are in the museum of the Capitol; two others, excavated under Alexander VII, are now in the Palazzo Chigi Odescalchi, while five, discovered in 1876 and 1883, remain near the site they decorated of old. When the unearthing of these sculptures, as well as of the fragments of architecture, is completed, we may hope for the careful study of the whole, and thus ultimately for a vivid picture of the old Portico of the Argonauts and its Temple of Neptune.

Extensive parts of the other and more superb structures, the Portici Pompeianæ, with their characteristic niches and circular temples, were, no doubt, marked features in Rome, even as late as the fifteenth and sixteenth centuries, as their beautiful remains are described both by Flaminio Vacca and Antonio San Gallo. The plan, moreover, that San Gallo makes of the ruins corresponds so exactly with a small ancient Roman one in marble, now in the Capitol, that Lanciani shows it to represent these very Portici Pompeianæ, the round temple on the plan being now a part of the cloisters of St. Nicolò a Cesarini. The ruins of this little temple will soon become one of the prominent features of modern Rome, for by the completion of the Via Nazionale it will be isolated from its present incumbering surroundings. The open spaces surrounded by the colonnades of ancient Rome, when not occupied for temples, often enclosed gardens in which fountains played, and where there were avenues of box-myrtle and plantain. Each portico had, besides, some individual attraction. In one were extensive maps in marble of the Roman empire: here the youth came to study geography. Another contained a vast museum of bric-à-brac from the Orient, and in still another were exhibited even the varying fashions of wearing the hair among the Roman ladies — a strange substitute for a hairdresser's window. But, no doubt, a far higher and more general use of the stately *portici* was to serve as museums of sculpture, while in a few pictures were kept. We know from ancient writers that by far the greater part of the masterpieces of Greek art, transported to Rome, found shelter in these *portici*, while the number of statues discovered in the ruins of the Portico of Octavia alone go to confirm their statement.

Excavations made in removing the carriage road, which, since the days of Gregory XXI, has swept across the Roman Forum in front of the Arch of Septimus Severus have brought much information concerning the famous rostrum built and dedicated by Augustus. Not only has the general construction of this massive platform for the ancient orator been made clear, but there have been found the very points where were attached the ships' prows which decorated it and gave it a name. The main part, it seems, consisted of an immense podium eighty-three and one-third Roman feet long, forty-five wide, and about twelve high. On this platform there was abundant room for higher officials, while below, on a semi-circular space, the less privileged could assemble. Space not permitting a detailed statement of these most interesting discoveries the student can only be pointed to Jordan's valuable account of them in the "*Annali*," Vol. LV.

One of the questions of Roman topography, termed even by the astute Mommsen *vexatissimum*, has always been as to the site of the Curia Hastilia, or place of assembling of the Roman Senate. This moot point Lanciani, aided by the study of mediæval documents, has at last been able to settle, showing that, while the Curia was remodelled successively by Scylla, Augustus, Domitian and Diocletian, it never changed its place, but was adapted by Onorio I in 603 A. D. to Christian worship, and is now preserved to us in the Church of St. Adriano, standing on the confines of the Forum and still sacred to the memory of the first martyr, who was brought to Rome to be buried.

Single statues of importance have also come to light on Roman soil. In the library of Hadrian's villa in Tivoli, a life-size figure in marble of Dionysius or Bacchus was discovered in a wonderful state of preservation, only the right hand being gone. It gives a new type of this god of easy flowing form, and may, most instructively be compared with the repetitions of the so-called Doryphoros, the Idolino of Florence, the superb bronze boy of the Saburoff collection now in the Berlin Museum, and with Stephano's mannered archaistic athlete in the Villa Ludovisi. From such comparison it becomes evident that in all these works some one great original artistic type was followed to represent widely different subjects, and that each reproduction varies greatly from its fellow in treatment and excellence. The New Bacchus is evidently by a master who belonged to the "eclectic" school, known to have flourished in Rome during the first century of the empire, and prone to combine the archaic outline of early models with the freer execution of detail practiced in its own day. An additional testimony to the activity of this school has been discovered in a figure of the Torlonia collection ignorantly restored as Hygeia, but even under such rude disguise, recognized to be the same as Menlaa's "Electra" in the Villa Ludovisi. But while the Ludovisi "Electra" is peculiarly grouped with a male figure, the new statue, judging from points of juncture, could not have been grouped in the same way, and hence we are safe in the conclusion that this type also was used to represent not only different persons, but was grouped with various figures, according to the caprice or necessity of the sculptor. Torlonia's restorer, not noticing the great diversity in marble and style, imagined that because the statue was found with an Esculapius it must be Hygeia and restored it accordingly. A still further calamity seems to await the statue, for now that the Prince has heard of its artistic identity with the "Electra," he intends, by giving it a mate, to make it an exact counterpart of the full Ludovisi group; thus will disappear entirely the indications of its true original character, by which the difference from the Ludovisi group is clear, making it valuable for the history of art.

With these sculptured monuments, interesting because of their illustration of the "eclectic" school and its affectations of the archaic, may be mentioned a widely different work from the Via Appia. It shows a gladiatorial combat in relief, and illustrates the more purely national, realistic school of art which flourished in Rome alongside of its affected sister. The art of this relief, while realistic, is exceedingly crude, but inscriptions characterizing the individual figure as *felicem*, *victorinum*, etc., lend a human interest to the scenes, making us look leniently upon the shortcomings of the art. It was originally, no doubt, the tombstone of some gladiator whose happy moods as victor are here recorded. From a gem described by Dressel we learn how the old Romans imagined the soul of the departed to appear, and doubtless also the original, whence came our modern images of the ghost. On this gem appears a spectral figure, closely wrapped in a long veil falling over head and face. This form is frequently met with in sarcophagi and other Roman monuments, but has never been fully understood. On this precious gem, however, the solemn figure is accompanied by the meaning inscription, "Soul of Magna, my mother." In passing we may notice that in Greece there is nothing of this weird and spectral art to be seen in connection with representations of the dead, for in Greek works the soul appears as a tiny winged image flying from the mouth of the outstretched dead; far more frequently the deceased appears still in the habiliments of life, generally holding sweet converse with family and friends.

From Pompeii the *Bullettino* brings reports of much that is new. To the representation of the Trojan horse, found mostly on gems, we have now added a large picture with very peculiar light effects. It represents the drawing of the horse within the precincts of Troy. In the background are the turreted walls of the city, with a temple in the midst, all lighted by the moon, while beyond appears the summit of Ida. At the point nearest the spectator the wall is broken down and piles of stone from the beach lie around. Toward this beach is being drawn the horse, pregnant with Greek soldiery, and appearing as a huge white animal on wheels. Five men in front pull with cords to the sound of music, and one pushes behind. Others are dancing, ecstatic with joy; women are carrying torches, and one seemingly supernatural figure, much larger than the rest, floats in the air above. Possibly this is Athena calling the Greeks. From the horse's head there seems to radiate a strong light upon the groups in the immediate neighborhood, while those in the distance are lighted by paler moonlight only. That the story of the Trojan horse should have interested the Pompeians seems most natural, but it is less easy to understand how the "Judgment of Solomon" came to be used as a decoration upon their walls. And yet this scene from Jewish history is unmistakably represented in one picture, where the child is about to be slain in the presence of the king and the two mothers. All the figures, however, are small and deformed, as though caricatures, and the fact that pigmies caught by hippopotami adorned the same house seems to indicate that this scene from Jewish history, as well as others of exploits of fabulous races on the Nile, must have come to Italy by way of Alexandria, well known to have been addicted to caricature and fun, and to have been familiar with Jewish as well as Egyptian lore.

Italian soil has also yielded many works of less pretentious art. Through painting on terra-cotta vases and through reliefs stamped on crude clay saucers, we are coming constantly nearer to the individuality of many humble craftsmen, as well as learning more and more of the intimate intercourse there must have been between ancient Italy and Greece through the peaceful medium of trade. Beautiful vases, painted by Greek artists in Athens during the age of Pericles, and thence exported to Etruria, are continually coming to light. On many of these the painter's name is found, so that in some cases there exist from one master alone as many as fifteen or twenty vases, and the number is not small of such Athenian masters thus known to us through vases once called Etruscan, because discovered on Etruscan soil, but now proved to be of Greek manufacture, imported by Etruscans to furnish their tombs. How great was the influence of trade in art objects in other parts as well appears from a study of Sardinian antiquities by Ebers, who compares them carefully with Egyptian monuments. From this it seems evident that the Phœnicians exported from the Nile Valley a few genuine small works of Egyptian art. But far more they imitated these Egyptian works, and, making variations upon them, exported their own wares to foreign shores, so that the larger part of the antiquities found in Sardinia seem to be these Phœnician reproductions. In some cases these appear to have acted upon native art until the nobler Greek influence remoulded the whole by its stronger creative force. It seems probable that by the close of the fourth century B. C. Phœnician forms ceased to be copied in Sardinia, and Greek forms prevailed. But, as in other parts of the Phœnician world, so here, as Ebers most strenuously affirms, it is well-nigh impossible to settle

the chronology of the cruder monuments. While Greek art, through commerce, early fructified lower forms along the Mediterranean, products of later days seem to have wielded a great influence in the North. This influence of trade with classic lands is proved, not only by a collection of inscriptions made by Undset from vessels found in Denmark and Northern Germany, but also by the identity of art forms in these vessels. Thus to three samples of a bronze vessel found in Denmark a mate was discovered in Herculaneum. — *Lucy M. Mitchell in the New York Times.*

SUGGESTIONS FOR THE GRANT MONUMENT.

August 12, 1885.

To the Editors of the American Architect: —

Dear Sirs, — I am glad to see that the two other leading architects — besides myself — have written to the papers giving their suggestions in regard to the Grant Monument; their ideas are good, but, *of course*, mine are better.

The public will readily recall what difficulty one of the leading citizens of Kalamazoo had to keep off the grass when going into his back-yard. I was called-in for consultation by his cook, and suggested a plank walk, thus solving this difficult problem.

You will readily appreciate how practical was this solution, while at the same time the walk, when kept clean, was pleasing to the eye, and therefore in the highest sense artistic; this will prove to you at once how well founded are my claims to do the Grant Monument.

My suggestion would be — but my office boy just rushes in to inform me that the fund has not as yet been raised, and perhaps it will be quite as well and dignified for the leading member of the profession to keep out of the scramble until it is raised.

Yours truly, Bumstead Valse.

THE ANNUAL CONVENTION, A. I. A.

Newport, R. I., August 17, 1885.

To the Editors of the American Architect: —

Dear Sirs,— Permit me through the medium of your journal to call the attention of architects to the importance of the approaching convention of the American Institute of Architects, to be held in the city of Nashville, Tenn., on the 21st and 22d of October, next.

At the Eighteenth Convention of the Institute, held at Albany, N. Y., on the 22d and 23d of October, 1884, much interest was manifested in the work, and in the steady development of our Institute Union. The attendance was larger than ever before, and the bonds of fellowship and common interest greatly strengthened. At this meeting a most courteous and cordial invitation was received from the Art Club of Nashville, requesting that the next meeting be held in that city. Mr. W. C. Smith, F. A. I. A., in extending the invitation on behalf of the Art Club, spoke as follows: —

Mr. President: If there is nothing else, I have a matter which I wish to present. Since my departure from Nashville, Tennessee, the Art Association of that city has held its annual meeting, and at that meeting adopted a resolution extending to the American Institute of Architects a cordial invitation to hold its next Annual Convention in our city. I hope that if it is possible to hold the Nineteenth Convention of the Institute in Nashville, the Board of Trustees will arrange to do so. There are certain reasons why I would like to see this done. In the first place the Convention has never been held in a Southern city. In the second place, I would like to have the influence of the American Institute of Architects extended farther south; I think it would do great good, not only in Nashville but in the South at large. True, we have very little there in the way of buildings that would be of interest to those of you who live farther north, but we have a few, however, that would be of interest to you all. Among them I would name one designed by the preceptor of our President, and another by Mr. W. A. Potter, which I think stands unsurpassed by any building in the United States — the United States Custom-House and Post-Office.

I hope, sir, that the Board of Trustees and the Institute will accept this invitation which is cordially extended by the Art Association of Nashville. The Association is seconded in this by several prominent citizens of Nashville, who desire that you hold your next meeting in our city, and I can assure you that you will be received with a warm welcome. We will extend to you some good old Tennessee hospitality. I hope, sir, the invitation will be accepted. I will read the formal resolution adopted at the last meeting of the Association, which has been transmitted by Mr. D. H. Rains. "It is with pleasure that I convey to you a resolution adopted to-night by the Nashville Art Association by its vote. The resolution was offered by Mr. Robert Shea. *Resolved*, That the Nashville Art Association, of Nashville, extend an invitation to the American Institute of Architects to hold its next Annual Convention in the city of Nashville."

At the June meeting of the Board of Trustees it was voted, in view of the expressed desire of many members of the Institute, to hold the Nineteenth Convention in Nashville, and Messrs. W. C. Smith, of Nashville; W. L. B. Jenney, of Chicago; George C. Mason, Jr., of Newport, and A. J. Bloor, of New York were appointed a Committee of Arrangements.

The Committee thus constituted has entered into the work with spirit, and have reported to the Board a preliminary programme, which is believed to be admirably calculated to interest and instruct the visiting members. This Convention will be the first of the kind ever held in a Southern city. Much good is expected from the bringing together of such a representative body of American architects from all points of our common country. All members of the A. I. A. who may be able to do so, are urgently requested to be present, and to take part in the discussion of the many important topics, which will be laid before them.

A preliminary circular, giving the general arrangements proposed for the meeting, will be issued within a few days, to be followed by a detailed order of proceedings, with cost of transportation, hotel accommodation, price of board, etc.

It is the desire of the Committee and the Board of Trustees, that this, the Nineteenth Convention of our Institute, shall be marked by a large attendance and a broad and intelligent discussion of all matters connected with the art of architecture which may come before it. The following words of our first President, Richard Upjohn, spoken at the Convention of 1867, are ever pertinent and encouraging. After sketching the early struggles and history of the Institute, Mr. Upjohn thus spoke of the future.

"It is the duty of every one of its members to throw the full force of his ability and influence, so far as the demands of his first duties towards himself and his dependants will permit, into the combined effort to make the Institute attain its object, and realize its noble ideal. If we do so, if we show that we respect our work, and ourselves as its doers; that we know what we mean, and mean to do it, so far as our providential opportunities will permit; if we make what we have done apparent, and show that we have well laid out our plans for the future, and have the men, the intellect and the culture to carry them out well, we shall find that Providence will not fail us, but will, through the medium of outside coöperators, supply us, according to our needs and our progress with the material means requisite to make our mental capital available."

Eighteen years have passed since these words were spoken. The Institute has developed and grown strong under its federal system of united chapters. A bright and useful future seems to be open before us, the art of architecture is more appreciated, and the practical science of building is more generally and better understood. To be members of the American Institute of Architects should be our pride, and an attendance upon its Annual Convention a journey of pleasure and of profit to all its Fellows and Associates.

Respectfully, George C. Mason, Jr., *Secretary A. I. A.*

NOTES AND CLIPPINGS.

The Percussive Effect of Falling Bodies. — As illustrating the force of a small object falling from a distance, a shot dropped from the dome of the State capitol at Des Moines, made a clean, neat hole through the inch glass floor in the rotunda. The *Blade* says that last winter a lady accidentally dropped a heavy muff from the same distance, and when it struck the floor below the noise was heard all over the building, and some supposed a gun had been fired off.

Liability of Innkeeper in Case of Infectious Disease.— G. went to the hotel of H., and there contracted small-pox, that disease, being in the house, and concealed from G. and other guests coming there. She sued for $5,000, having been taken to the "pest house," seriously ill, and becoming greatly disfigured by the marks of the malady. She recovered a judgment, and the innkeeper carried the case — Gilbert *vs.* Hoffman — to the Supreme Court of Iowa, where the judgment was affirmed. Judge Reid, in the opinion, said: "When the plaintiff went to the hotel one of the guests was lying ill in the house, and the disease turned out to be small-pox. It appears that the defendant was told the day before plaintiff came to his house that the complaint was small-pox, as it was shown to be, and yet he took no precaution to protect those coming as his guests. Indeed, there is evidence showing that the defendant assured the plaintiff that the disease was not in his house. That the defendant is liable there can be no doubt. He is bound to protect guests coming to his house from any danger whatever. By keeping his hotel open for business, he, in effect, represented to all travellers that it was a reasonably safe place at which to stop, and he is hardly in a position now to insist that one who accepted and acted on his representation, and was injured because of its untruth, shall be precluded from recovering against him for the injury, on the ground that she might, by further inquiry, have learned of its falsity."—*Iron Age.*

Martello Towers. — "Before the martello towers all disappear from the Irish seaboard," writes a correspondent, "the purpose and story of them are worth a passing notice. They were built at the end of the past century to protect the coast from an anticipated French attack. There are many of them along the English shore (visitors to Quebec will remember the one pointed out there), but Ireland was the expected scene of invasion, and was at the time the least protected part of the three kingdoms. As a matter of fact the French fleet did ride in Bantry Bay, and an invasion was always dreaded. Lord Cornwallis was Viceroy, and he ordered a series of forts to be built wherever there might be fear of the French landing. It was necessary to select some plan of construction, and it was thought desirable that the same model should be adopted in all cases. It happened that the Duke of Richmond had just returned from the Mediterranean, where he had witnessed the bombardment of a little town on the shores of Corsica by a well-equipped fleet. The cannon were of heavy calibre, but the projectiles could make no impression on a little circular fort built of stone, which stood triumphantly a constant fire. These were not the days of rifled cannon. The Duke made a note of the circumstance, and when a model had to be adopted suggested the fort which had done such service in the siege of Martella. The town seems now to be forgotten, but the name of it in a corrupted form has at least got a foothold in the English language, and may puzzle an etymologist of the future, as indeed the towers themselves — if a few should survive the lapse of centuries — may confound the Pickwicks of a coming day." — *Pall Mall Gazette.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

323,387. VENTILATOR FOR SHOW-WINDOWS.—John N. Baer and Jesse S. Edwards, Philadelphia, Pa.

323,393. KNOB-ATTACHMENT. — Chas. W. Bullard, Chicago, Ill.

323,426. PAINT-POT. — Caroline M. Hills, Chicago, Ill.

323,422. SCREW-NUT. — Edward C. Ibbotson, Boston, Mass.

323,424. METHOD OF CUTTING AND EMPLOYING WOODEN BEAMS AND GIRDERS. — Peter H. Jackson, San Francisco, Cal.

323,431. APPARATUS FOR PURIFICATION OF WATER.—Albert R. Leeds, Hoboken, N. J.

323,437. STATIONARY WASH-STAND. — Clarence Morfit, New York, N. Y.

323,454. AUGER-BIT.—Fisk Shaller, Chester, Conn.

323,464. DIE-STOCK.—John W. Strong, Bridgeport, Conn.

323,473. WATER-CLOSET BOWL. — Henry C. Weeden, Boston, Mass.

323,492. CONTINUOUS BRICK-KILN. — Max. A. Th. Boehncke and Henry Rohwer, Omaha, Neb.

323,508. SAW-HANDLE. — James Hilton, Newark, N. J.

323,517. PLANE-HOLDER.—Frank F. Mattoon, Boston, Mass.

323,518. PROTECTING BUILDINGS FROM FIRE. — Jonathan G. Merrill, Quincy, Mass.

323,532. GREASE-TRAP FOR SINKS. — John Reid, Yonkers, N. Y.

323,549. WATER-CLOSET BOWL. — Henry C. Weeden, Boston, Mass.

323,563. FAUCET FOR WASH-BOWLS. — Thomas C. Clark, Cohoes, N. Y.

323,564. MORTISE-LOCK. — George B. Cowles, New Britain, Conn.

323,576. PROTECTING SCREEN FOR AIR AND LIGHT SHAFTS.—Augustus A. Hagen, New York, N. Y.

323,578. AUTOMATIC FIRE-EXTINGUISHER. — William Harkness, New York, N. V.

323,587. HOUSE-VENTILATION. — Lewis Merriman, Beloit, Wis.

323,595. PLANE-GUIDE.—William W. Preston, Coldwater, Mich.

323,603. SASH-HOLDER. — Henry Staib, Jeffersonville, N. Y.

323,655. VISE.—Ole Flagstad, Hamar, Norway.

323,658. DOOR.—Jeuleos Gambliee, Cresskill, N. J.

323,697. FLOORING.— Samuel C. Little, Mount Vernon, Ind.

323,707. WATER-CLOSET VENTILATOR. — John H. McGovern and Jas. H. Wilson, Detroit, Mich.

323,741. SASH-FASTENER. — Anton Schmackers, Birmingham, Ala.

323,748. LOCKING DEVICE FOR JAILS. — Charles S. Snead and Udolpho Snead, Louisville, Ky.

323,757. PRESS FOR PLASTIC MATERIAL FOR BUILDING-BLOCKS. — C. Irvine Walker and Frank J. Jervey, Charleston, S. C.

323,776. — AUTOMATIC SELF-SETTING WRENCH.— Benjamin F. Bennett, Lockport, N. Y.

323,778. COMBINED WATER-GAUGE AND FAUCET. —John G. L. Boettcher, Brooklyn, N. Y.

323,804. BENCH-PLANE. — John P. Gage, Vineland, N. J.

323,833. SAW-HANDLE.—William R. Towse, Columbus, O.

323,855. PRISON-DOOR BOLT. — William Corry, Cincinnati, O.

323,863. FASTENING FOR BLIND-SLATS. — Geo. F. Evans, Corpus Christi, Tex.

323,867. WINDOW-SASH. —Lucinda Fuller and Harriet Fuller, Detroit, Mich.

SUMMARY OF THE WEEK.

Baltimore.

STORE AND DWELLINGS. — S. R. Robison, Esq., is to have built a three-st'y brick, stone and terra-cotta store and dwell., lot 32′ x 46′ and 50′, s e cor. Madison and North Ave., and 4 three-st'y dwells. adjoining on Madison Ave., of brick and stone, on lot 56′ x 100′, from designs by W. Claude Frederic, architect.

TERRACE. — Wm. J. Taylor, Jr., is to have 14 Queen Anne dwells. built around Baker Circle, Fulton Ave., to cost $30,000, from plans by W. Claude Frederic, architect.

DWELLINGS.— Frank E. Davis, architect, is preparing drawings for E. K. Boyd, Esq., for 9 two-st'y brick buildings, 12′ x 46′, to be erected cor. Baker and Calhoun Sts., and to cost $13,000.

BUILDING PERMITS. — Since our last report nineteen permits have been granted, the more important of which are the following: —

Caleb Kelly, 2 three-st'y brick buildings, in rear s s McHenry St., between Fremont and Sterrett Sts.

Graham & Schmitt, four-st'y brick building, s s Baltimore St., between Harrison St. and Jones Falls.

N. C. R. W. Co., three-st'y brick building, e s Charles St., n of Jones Falls.

Jos. Flynn, three-st'y brick building, s e cor. Saratoga St. and Watchhouse Alley.

Samuel Black, 2 three-st'y brick buildings, e s Maryland Ave., commencing n e cor. Townsend St.

A. Gottschalk, three-st'y brick building, n w cor. Monument St. and Duncan Alley.

Gill & Lee, 6 three-st'y brick buildings, e s North St., s of Chase St.

Boston.

HOTEL. — A new hotel, to be called the Victoria, is to be erected at the cor. of Dartmouth and Newbury Streets, for Barnes & Dunklee of Hotel Brunswick. It is proposed to have about two hundred and fifty apartments, and to have a public cafe on the first floor.

Brooklyn.

SOLDIERS' AND SAILORS' MONUMENT. — The model of the new soldiers' and sailors' monument in Brooklyn will be ready in the course of the fall. J. Q. A. Ward, sculptor, is working up the detail designs from the general plan furnished by Richard M. Hunt, the architect. The plaza at the entrance of Prospect Park has been decided upon as the location for the monument, which it is estimated will cost $250,000.

BUILDING PERMITS. — *Stuyvesant Ave.*, e s, 100′ n Gates Ave., 2 four-st'y brick tenements, tin roofs; cost, each, $6,500; owner, John Weigel, 835 Gates Ave.; architect, J. Erickson.

Seventh Ave., n w cor. Fourteenth St., four-st'y brick store and dwell., tin roof; cost, $12,000; owner, John Gallagher; architect, F. Ryan; builders, Assip & Buckley and Daniel Ryan.

Hull St., s w cor. Stone Ave., three-st'y brick store and dwell., gravel roof; cost, $1,500; owner, Henry C. Baker, 1108 Fulton St.; architect, A. Hill.

Hull St., s s, 20′ w Stone Ave., 8 three-st'y brick dwells., gravel roofs, wooden cornices; owner and architect, same as last.

Elder St., s s, 359′ 6″ e Broadway, 6 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $3,600; owner, H. C. Bauer; architect, T. J. Bier.

Cooper Ave., n s, 225′ e Bushwick Ave., and *Van Voorhis St.*, s s, 225′ e Bushwick Ave., 28 two-st'y frame (brick-filled) dwells.; cost, each, $2,400; owner, architect and builder, Walter E. Maryatt, 525 Quincy St.

Leonard St., e s, 112′ 11′ n Van Cott Ave., 3 three-st'y frame (brick filled) tenements, gravel roofs; cost, each, $3,500; owners, Mary F. Bradley and Thos. E. Sutton, 523 Leonard St.; architect, W. Fenwick; builders, T. E. Sutton and Gately & Smith.

Second St., n s, 158′ e Seventh Ave., three-st'y brown-stone dwell., tin roof; cost, $10,000; owner, H. F. A. Smith, 426 Third St.; architect, J. Kastner; builder, day's work.

Greene Ave., s s, 290′ w Reid Ave., 5 three-st'y brown-stone dwells., gravel roofs; cost, each, $7,000; owner and architect, J. Doherty, 288 Flatbush Ave.

Gold St., w s, 43′ n Willoughby St., three-st'y brick store and dwell., tin roof; cost, $3,000; owner, Henry Lichefett, 135 Willoughby St.; builders, F. Metzler and C. Lohrentz.

Fulton St., n s, 75′ e Reid Ave., 3 three-st'y brick stores and tenements, tin roofs; cost, each, $3,600; owner, Jeffrey Van Wyck, Flatbush, L. I.; architect, A. Hill; builders, C. Bawe and J. Stout & Bro.

Rockaway Ave., w s, 80′ s Fulton St., 2 three-st'y brown-stone stores and dwells., gravel roofs; cost, each, $5,000; owner, Geo. R. Brown, 34 South Portland Ave.; builder, L. E. Brown.

Hamburg St., n w cor. George St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $5,500; owner, Joseph Klein; architect, J. Platte; builders, J. Bossert and J. Auer.

Greene Ave., n s, 260′ e Seaman Ave., two-st'y frame mansard, brick and terra-cotta dwells., tin and slate roof; cost, $10,000; owner, Isaac C. De Bevoise, 104 De Bevoise Ave.; builders, S. J. Burrows and Marinus & Gill.

Clifton Pl., *No.* 281, 200′ w Nostrand Ave., four-st'y brick tenement, mansard gravel roof; cost, $13,000; owner and architect, J. Graham Glover, 219 Montague St.; builder, A. Itutan; contractor, not selected.

Fourth Ave., w s, 40′ 2″ s Fifty-second St., two-st'y frame store and dwell., tin roof; cost, $4,500; owner, Mrs. Jennie Roy, Fifty-second St., cor. Fourth Ave.; architect, A. F. W. Leslie; builder, day's work.

Franklin Ave., w s, 75′ s Flushing Ave., three-st'y frame store and dwell., tin roof; cost, $4,800; owner, George Malcolm; architect, I. D. Reynolds; builder, R. Payne.

Chicago.

BUILDING PERMITS. — S. E. Gross & Co., 8 two-st'y stores and flats, Madison St.; cost, $25,000.

J. Maitland, four-st'y store and flats, 234-236 Halsted St.; cost, $18,000; architect, W. Strippelman.

J. Sweetman, 4 two-st'y dwells., 1016-1022 Washington St.; cost, $12,000.

N. E. Nelson, two-st'y dwell., 453 Dayton St.; cost, $5,000.

W. Nelson, two-st'y dwell., 78 Le Moyne St.; cost, $3,000.

P. L. Bradin, two-st'y flats, 595 Harrison St.; cost, $3,500; architect, C. R. Adams.

H. Huesman, two st'y dwell., 47 Johnson St.; cost, $3,500.

M. Heinemann, two-st'y dwell., 211 Webster Ave.; cost, $3,000.

C. Wagner, two-st'y dwell., 134 Superior St.; cost, $4,000.

H. Buels, two-st'y dwell., 1075 Blue Island Ave.; cost, $3,400.

M. E. Mann, two-st'y dwells., 132-134 Thirty-fourth St.; cost, $7,000.

J. H. Leidig, two-st'y dwell., 353 Ashland Ave.; cost, $12,000.

O. Dougherty, two-st'y dwell., 472 Paulina St.; cost, $2,500.

J. Sheahan, two-st'y dwell., 3353 Prairie Ave.; cost, $5,000.

L. Lutz, three-st'y store and flats, 240 North Ave ; cost, $6,000.

F. Stanber, two-st'y flats, 116 Jay St.; cost, $2,800.

G. Carlson, two-st'y dwell., 35 Moore St.; cost, $2,-500.

J. Larson, three-st'y flats, 149 Oak St.; cost, $6,-000.

J. Dopp, two-st'y dwell., 425 North Ashland Ave.; cost, $2,500.

C. Manske, three-st'y flats, 645 West Harrison St.; cost, $6,000.

H. Klotz, cottage, 889 Hinman St.; cost, $2,500.

H. Jaeger, cottage, 891 Hinman St.; cost, $2,500.

F. Heinemann, three-st'y store and flats, 620 Wells St.; cost, $7,500.

C. E. Kremer, two-st'y dwell., 322 Ashland Ave.; cost, $9,000.

R. A. Barclay, 5 two-st'y dwells., 3651-3659 Grand Boulevard: cost, $35,000: architect, W. A. Furber.

H. Byrne, three-st'y dwell., 3519 Wabash Ave.; cost, $5,000.

C. Stern, three st'y dwell., 2963 Prairie Ave.; cost, $12,000; architects, Adler & Sullivan.

C. Tarnow, two-st'y dwell., 470 West Fourteenth St.; cost, $3,800.

D. J. Wren, 8 cottages, 235-249 Harvey St.; cost, $4,500.

P. Juergens, three-st'y store and dwell., 827 Milwaukee Ave.; cost, $10,000; architect, O. Matz.

P. J. Ryan, three-st'y store and dwell., 687 and 689 Van Buren St.; cost, $8,000.

Reddenger & Hofer, two-st'y ice-house, 362 Clark St.; cost, $3,000.

D. T. Cohrs, three-st'y store and flats, 3701 Halsted St.; cost, $8,000.

J. Opp, two-st'y store and dwell., 745 Chicago Ave.; cost, $3,000; architect, J. Blattner.

N. J. Enk, two-st'y flats, 3726 Calumet Ave.; cost, $4,000.

J. G. Dietrich, two-st'y flats, 251 Hirsch St.; cost, $2,800.

C. Zept, 2 three-st'y stores and dwells., 120 and 122 West Lake St.; cost, $20,000; architects, Hildinger & Ohlbaber.

Barnard & Calkins, 4 two-st'y dwells., 295 Marshfield Ave.; cost, $12,000.

O. Nelson, two-st'y dwell., 38 Keith St.; cost, $3,500; architect, T. Thorson.

F. Diesel, two-st'y factory, 703 and 705 North Halsted; cost, $6,000.

R. A. Keyes, three-st'y dwell., 1227 Michigan Ave.; cost, $9,000.

J. T. Hale, seven-st'y factory, 298 Dearborn St.; cost, $20,000; architect, J. M. Van Osdel.

W. Horacek, two-st'y store and dwell., 540 Twentieth St.; cost, $4,000.

Mrs. S. Allerton, 2 two-st'y dwells., 45 and 47 Bryan Pl.; cost, $5,000; architect, W. H. Drake.

V. Koehl, two-st'y dwell., 333 Dayton St.; cost, $3,000.

C. J. Rode, three-st'y store and dwell., 502 Wells St.; cost, $7,000.

E. Earnshaw, two-st'y dwell., 364 Ontario St.; cost, $6,000.

M. M. Warner, three-st'y store and flats, 975 West Lake St.; cost, $8,000.

Wm. Oakley, three-st'y flats, 349 Centre Ave.; cost, $5,500.

Mrs. D. O. McKinley, three-st'y flats, 219 Aberdeen St.; cost, $4,000.

J. Niemczewski, 2 three-st'y stores and dwells., 605 and 607 Noble St.; cost, $12,000; architect, H. Kley.

J. McCouthe, 2 two-st'y dwells., 1195 and 1197 Washington St.; cost, $10,000; architect, J. M. Van Osdel.

C. R. Dix, three-st'y flats, 2226 Indiana Ave.; cost, $4,000.

W. F. Behrens, three-st'y dwell., 774 Sedgwick St.; cost, $5,000.

Tollen & Madden, 4 two-st'y dwells., 3721-3727 Prairie Ave.; cost, $12,000.

L. Pomrehn, two-st'y dwell., 249 West Division St.; cost, $4,000; architect, Weber.

J. Mint, two-st'y dwell., 651 Holt St.; cost, $3,000.

M. Kochanski, three-st'y store and dwell., 414 Noble St.; cost, $5,000; architect, Runde.

J. Donnellan, two-st'y dwell., 390 Maxwell St.; cost, $3,200.

J. L. Lombard, 2 two-st'y dwells., 901 and 903 Kedzie Ave.; cost, $6,000; architects, Ostling & Bourgeois.

J. L. Lombard, 2 two-st'y dwells., 886 and 890 Kedzie Ave.; cost, $5,000; architects, same as last.

J. E. Otis, two-st'y additional, 278 and 280 State St.; cost, $6,000; architect, W. H. Drake.

J. Brady, two-st'y dwell., 221 North Leavitt St.; cost, $2,500.

M. Veith, three-st'y store and dwell., 3109 Wentworth Ave.; cost, $7,000; architect, J. Frank.

L. Matthei, 2 four-st'y stores and dwells., 138 Canalport Ave.; cost, $10,000; architect, H. Sierks.

W. Shortall, two-st'y store and dwell., 2725 Dashiel St.; cost, $2,900.

J. Wokonn, three-st'y dwell., 115 Nineteenth St.; cost, $3,500.

J. R. Low, four-st'y store and flats, 48 West Madison St.; cost, $8,000.

Turner & Bond, 4 cottages, Hanover St.; cost, $4,000.

Turner & Bond, two-st'y store, 2950 Butler St.; cost, $3,000.

L. Dietrich, three-st'y store and flats, 389 Division St.; cost, $11,000; architect, A. Baumann.

M. Holub, two-st'y store and dwell., 3523 Halsted St.; cost, $3,600.

G. Edwards, 6 two-st'y dwells., 745-755 Taylor St.; cost, $20,000: architect, F. Keltemch.

T. & P. Sullivan, three-st'y store and dwell., 302 Wells St.; cost, $5,000; architect, G. Spohr.

J. Anderson, three-st'y store and dwell., 265 West Indiana St.; cost, $7,000; architect, G. Isaacson.

T. Thrun, two-st'y dwell., 153 Rumsey St.; cost, $3,000.

P. Wichert, three-st'y flats, 293 North Franklin St.; cost, $8,000; architect, G. Bloedner.

Kansas City, Mo.

Conrad Swissler, 1020 Union Ave., three-st'y brick business house; cost, $5,000.

Dr. J. K. Stark, brick block, cor. Broadway and Eleventh Sts., cost, $9,000.

J. G. Minnear, frame dwell. on Vine St.; cost, $3,500.

Board of Education, school-house, cor. Seventeenth and Wyandotte Streets; cost, $16,000.

James Hughes, brick business block, cor. Seventh St. and Broadway; cost, $9,000.

M. W. St. Clair, block, cor. Eleventh and Washington Sts.; cost, $12,000.

M. S. Tyler, brick and cut-stone dwell., on East Fifteenth St.; cost, $10,000.

D. P. Thomson, brick dwell., cor. Fifteenth and Penn Sts.; cost, $4,000.

R. H. Smith, dwell. on Tracy Ave.; cost, $6,500.

Malcolm Bliss, brick block on Campbell St.; cost, $15,000.

Jerry Quinn, brick dwell., 407 Holmes St.; cost, $3,500.

J. M. Hallett, brick dwell., 726 Holmes St.; cost, $4,000.

Memorial Lutheran Church, brick and cut-stone church, 33′ x 50′, cor. Sixth and Tracy Sts.; cost, $5,000.

Eugene Carlat, brick business block, East Third St.; cost, $8,000.

Mary E. Gridley, brick business block, East Eighteenth St.; cost, $3,500.

O. A. Kenyon, block, Missouri Ave.; cost, $5,000; and brick block, Locust St.; cost, $10,000.

J. O. Day to build a brick block, 1723, 1725 and 1727 Locust St.; cost, $6,000.

B. Schoen, business block, 114-116 West Fifth St., 56′ x 110′, five-st'y of brick and cut-stone, to be completed January 1, 1886; cost, $60,000.

L. T. Moore, addition to dwell., cor. Twelfth and Washington Sts.; cost, $4,000.

Albert Marty, 3 brick dwells., 702, 704 and 706 East Fourteenth St., cost, $5,200 each; and one brick dwell., cor. Garfield and Independence Aves., cost, $7,000.

R. S. Owen, 2 brick dwells., 214 West Third St.; cost, $4,000.

S. F. Scott, brick dwell., cor. Eleventh and Elliott Sts.; cost, $9,000.

J. S. Chase, brick dwell., 1721 Locust St.; cost, $3,000.

John S. Sutherland, brick dwell., cor. Thirteenth and Wyandotte Sts.; cost, $12,000.

Minneapolis, Minn.

BUILDING PERMITS. — City of Minneapolis, Holden St., bet. Highland and Border Aves.; cost, $6,800.

Mrs. Esther Curtis, four-st'y brick store and office building, 106 Washington Ave., s; cost, $18,000.

A. Hatheway, two-st'y wood dwell., Hawthorne Ave. cor. Seventeenth St., n; cost, $10,000.

Fred. D. Noerenberg, Twenty-first Ave., s, near Twentieth, eight-st'y stone malt-house; cost, $30,000.

Louis A. Egolf, one-and-one-half-st'y wood dwell., w s East Twenty-first St. cor. Ninth Ave.; cost, $3,500.

Anthony Suchaneck, two-st'y wood dwell., n e cor. First Ave. and Twenty-sixth St., cost, $6,000.

H. W. Smith, 2 two-st'y wood dwells., w s Twelfth Ave. bet. East Twenty-eighth and East Twenty-ninth Sts.; cost, $3,600.

Mary J. Ryckman, 3 two-st'y wood dwells., w s Blaisdell Ave., bet. West Thirtieth and West Thirty-first Sts.; cost, $5,400.

Charles Johnson, two-st'y wood dwell., n e cor. South Freeman St., and Twenty-fourth St.; cost, $5,000.

D. H. Murray, two-st'y wood dwell., w s Stevens Ave., bet. East Fourteenth and East Fifteenth Sts.; cost, $5,000.

W. L. Stevens, two-st'y wood dwell., w s Lyndale Ave., bet. Twenty-fourth cor. Twenty-fifth Sts.; cost, $3,500.

St. Joseph Society (Catholic), one-st'y stone church, w s Fourth St., bet. Eleventh and Twelfth Aves., n; cost, $40,000.

Home for Aged Women and Children, two-st'y brick dwell., s e cor. Thirty-second St. and Stevens Ave.; cost, $39,000.

James F. Johnson, two-st'y wood dwell., s w cor. Harriet Ave. and West Lake St.; cost, $3,500.

Northern Mill Company, one-st'y brick planing mill, n e cor. Thirty-second Ave. and One-and-one-half St., n; cost, $15,000.

Jackson & Cooper, four-st'y brick warehouse, w s Third Ave., bet. First and Second Sts., n; cost, $20,000.

Campbell Bros., two-st'y wood dwell., w s Garfield Ave., bet. West Twenty-fifth and West Twenty-sixth Sts.; cost, $4,000.

W. G. Bebb, two-st'y wood dwell., e s Thirteenth Ave., bet. Carew and Talmage Aves., s; cost, $3,500.

Charles Brewster, one-and-one-half-st'y wood dwell., w s Stevens Ave., bet. East Twenty-fourth and East Twenty-fifth Sts.; cost, $4,500.

C. D. Havere, alterations wood dwell., w s Twelfth Ave., bet. Third and Fourth Sts., s; cost, $3,500.

Louis Laramee, two-st'y wood dwell., e s Highland Ave.; cost, $5,000.

Frank N. Barons, two-st'y wood dwell. and barn, e s South Aldrich Ave., bet. West Twenty-fifth and West Twenty-sixth Sts.; cost, $3,000.

A. F. Riebeth, 4 two-st'y wood stores, s s Sixth Ave., bet. Dupont and Emerson Aves.; cost, $6,000.

August Wordeli, two-st'y brick veneer dwell., s s Twenty-eighth St., bet. Eleventh and Twelfth Aves., s; cost, $3,000.

Lorenzo D. Parker, two-st'y brick wareroom, s w s Fourth St., bet. Nicollet and Hennepin Aves., s; cost, $4,000.

J. A. & F. W. Robinson, four-st'y brick store, s w s Fifth St., bet. Nicollet and Hennepin Aves.; cost, $18,000.

Frank N. Barons, two-st'y wooden dwell. and barn, South Aldrich Ave., bet. West Twenty-fifth and West Twenty-sixth Sts.; cost, $3,000.

A. R. Riebeth, two-sty'y wooden store-building and dwell., Sixth Ave., bet. Dupont and Emerson Aves.; cost, $6,000.

Charles E. Brewster, one-and-one-half-st'y wooden dwell., Stevens Ave., bet. East Twenty-fourth and East Twentieth Sts.; cost, $4,500.

Philadelphia.

BUILDING PERMITS. — *Edmond St.*, cor. Margaretta St., two-st'y dwell., 12′ x 48′; Chas. Strickler, owner.

Cresson St., n s, w Penn St., alteration, 40′ x 60′; L. Loughrey, contractor.

Fourth St., above York St., 3 two-st'y dwells., 12′ 6″ x 28′; A. M. Hoffman, contractor.

Cumberland St., e Twenty-sixth St., 26 two-st'y dwells., 15′ x 30′; C. W. Hause, owner.

Cuthbert St., s s, w Eighteenth St., stable, 116′ x 233′; W. F. Kaehm, contractor.

South Eighth St., *No.* 214, two-st'y brick building, 17′ x 33′; E. Douglass, contractor.

Hancock St., n Lehigh Ave., four-st'y addition; Chas. Boori, contractor.

Master St., w Twenty-fifth St., 12 two-st'y dwells.; John G. Ruff, contractor.

Forty-first St., n s, n Haverford St., 3 two-st'y dwells.; Geo. Heiser, contractor.

Brown St., w Thirty-sixth St., 3 two-st'y dwells., Louis Smith, owner.

Thirty-seventh St., n Aspen St., 6 two-st'y dwells.; Louis Smith, owner.

Pulaski Ave., e Germantown Ave., three-st'y dwell.; B. Walker, contractor.

Taylor St., n Parrish St., 47 two-st'y dwells.; Jno. M. Sharp, owner.

Grays Lane, w Woodland Ave., 2 three-st'y dwells.; Robert Parker, owner.

Wallace St., *No.* 2211, three-st'y dwell., J. England & Bro., owners.

Gordon St., s of Sepovia St., 2 three-st'y dwells., J. H. Buchanan, contractor.

Westminster Ave., w Forty-first St., 2 three-st'y dwells.; J. H. Bronley, owner.

Gordon St., e Tulip St., 3 two-st'y dwells.; Jno. Bradford, owner.

Dickinson St., w Twentieth St., 6 two-st'y dwells.; Jno. Simpson, owner.

Lambert St., s Dickinson St., 13 two-st'y dwells.; Jno. Simpson, owner.

Fifteenth St., s Kater St., 4 two-st'y dwells.; A. A. Catanach, contractor.

Forty-sixth St., n Aspen St.; three-st'y dwell.; Robert Beatty.

New York.

BUILDING PERMITS. — *Division St.*, *No.* 139, five-st'y brick tenement, with stores in first story, tin roof; cost, $9,000; owner, Mrs. Elizabeth Lutz, on premises; architect, F. Jenth.

Battery Pl. and North River, Pier A, two-st'y iron-front building, tin roof; cost, about $44,000; owner, Department of Docks, 119 Duane St.

Stanton St., n s, 47′ 6″ w Norfolk St., two-st'y and basement brick church; cost, $50,000; owners, Trustees of Old Epiphany House; architect, C. C. Haight, builder, D. H. King, Jr.

East Seventeenth St., *No.* 143, one-st'y brick and stone restaurant, tin roof; cost, $9,000; owner, Carl Goerwitz, 149 East Fifty-eighth St.; architects, Schwarzmann & Buchman.

Forty-first St., n s, 57′ w First Ave., five-st'y brick tenement, tin roof; cost, $22,000; owners, architects and builders, Dawson & Archer, 4 Prospect Pl.

Forty-first St., n s, 87′ w First Ave., 2 five-st'y brick tenements, tin roofs; cost, each, $20,000; owners, etc., same as last.

West Fifty-fourth St., *No.* 152, three-st'y stone private stable, tin roof; cost, $10,000; owner, Wm. B. Baldwin, 123 West Fifty-fourth St.; architect, G. B. Pelham; builders, David Kennedy and Chas. Sutton.

First Ave., n e cor. Forty-second St., five-st'y brick tenement, tin roof; cost, $22,000; owner, Mrs. Mulholland, 324 East Eighty-first St.; architect, J. C. Burne.

First Ave., e s, 25′ n Forty-second St., five-st'y brick tenement, tin roof; cost, $18,000; owner and architect, same as last.

Forty-second St., n s, 75′ e First Ave., five-st'y brick tenement, tin roof; cost, $14,000; owner and architect, same as last.

Sixth Ave., e w cor. Fifty-eighth St., five-st'y brick apartment-house, slate roof tinned, mansard slated; cost, $250,000; owners, Harris Bros., 877 Broadway; architects, A. Zucker & Co.; builder, not selected.

East One Hundred and Sixth St., *Nos.* 116 *and* 118, two-st'y brick school-house, tin roof; cost, $3,000; owner, The Corporation of St. Cecilia's Church, 123 East One Hundred and Fifth St.; architect, A. Spence.

Seventy-ninth St., n s, 250′ e Tenth Ave., 6 five-st'y brick dwells., deck roof tinned, mansard slated; cost, each, $15,000; owners and architects, Hubert, Pirsson & Co., 19 East Twenty-eighth St.

Eighty-third St., s s, 255′ e Tenth Ave., 5 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $16,000; owner, Mary J. Coar, 156 West Fifty-eighth St.; architects, Thom & Wilson.

Ninety-fifth St., s s, 259′ e Tenth Ave., 6 three-st'y brick dwells., tin roofs; cost, each, $12,000; owner, architect and builder, Wm. J. Merritt, 152 West One Hundred and Twenty-seventh St.

Seventieth St., n w cor. Ninth Ave., five-st'y brick flat, tin roof; cost, $25,000; owner, T. Farley, 402 West Seventy-third St.; architects, Thom & Wilson; built by day's work.

Seventieth St., n s, 25′ w Ninth Ave., 4 four-st'y brick (stone-front) dwells., tin roofs; cost, each, $19,000; owners, T. Farley & Son, 402 West Seventy-third St.; architects, Thom & Wilson; built by day's work.

Ninetieth St., n s, 100′ e Ninth Ave., 2 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $14,000; owner, Geo. A. Thomas, 1237 Franklin Ave.; architect, Wm. F. Burroughs.

Ninetieth St., n s, 137′ 6″ e Ninth Ave., 2 three-st'y brick dwells., tin roofs; cost, each, $14,000; owner and architect, same as last.

Ninetieth St., n s, 175′ e Ninth Ave., 2 four-st'y and basement brick dwells., slated mansard and flat tin roofs; cost, each, $20,000; owner and architect, same as last.

Ninetieth St., n s, 216′ 6″ e Ninth Ave., 2 four-st'y brick (stone-front) dwells. with extensions, slated mansard and flat tin roofs; cost, each, $20,000; owner and architect, same as last.

Tenth Ave., e s, 50′ n One Hundred and Fifty-sixth St., four-st'y brick tenement, tin roof; cost, $8,500; owner, Martin S. Spoulein, One Hundred and Thirty-seventh St. and St. Nicholas Ave.; architect, Wm. Kusche.

Eleventh Ave., e s, 75′ s One Hundred and Seventy-third St., three-st'y brick tenement, tin roof; cost, $5,500; owner and architect, J. Henry Borchers, 217 Seventh St.; builders, Patrick Connelly and Louis Ilseman.

North Third Ave., n w cor. One Hundred and Fifty-sixth St., four-st'y brick tenement with store, tin roof; cost, $14,000; owner, Mary A. Rich, 753 North Third Ave.; architect, Adolph Pfeiffer.

Vyse Ave., w s, 225′ s Tremont Ave., one-st'y frame church; cost, $6,000; owner, the rector, wardens, etc. of Grace Church, West Farms; architect, Wm. A. Potter; builder, J. E. Dolen.

Brook Ave., e s, 50′ n One Hundred and Forty-seventh St., two-st'y brick dwell., tin roof; cost, $4,000; owner, John Diehl, 1005 East One Hundred and Forty-ninth St.; architect, Charles Volz; builder, not selected.

St. Louis.

BUILDING PERMITS. — Forty-four permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

H. Sayers, 3 adjacent two-st'y store and dwells.; cost, $9,000; H. Sayers, contractor.

Wm. Hilmer, two-st'y brick dwells., cost, $3,000; H. W. Rocklage, contractor.

Five-st'y alteration; cost, $16,000; Francis D. Lee, architect; B. Weber & Co., contractors.

J. G. Brauer, two-st'y brick dwell.; cost, $4,500; Wanhoff & Kennel, contractors.

St. Louis Public School Board, three-st'y brick addition to school; cost, $15,500; Wilhelmi, architect; H. R. Becker, contractor.

Mrs. Jos. Von der Au, two-st'y brick dwell.; cost, $5,000; Wm. Whri, architect; A. Whri, contractor.

Mrs. E. H. Kingsland, two-st'y brick store; cost, $5,000; I. Baker, contractor.

Geo. Weber, two-st'y brick store and dwell.; cost, $2,550; C. C. Helmers, architect; Volk & Tacke, contractor.

W. T. Mixon, two-st'y brick dwell.; cost, $3,000; W. T. Mixon, contractor.

St. Paul, Minn.

BUILDING PERMITS. — Two-st'y frame dwell., s s of Parker St.; bet. Wilder and Union Aves.; cost, $3,300; owner, C. W. Southwick.

Two-st'y frame dwell., w s of Grant St., bet. Viola and Bianca Sts.; cost, $4,000; owner, William Stockton.

Four-st'y brick stores and offices, s s of East Fourth St., bet. Robert and Jackson Sts.; cost, $19,000; owners, McAllister, Pearson & Smith.

Two-st'y frame dwell., n s of Laurel Ave., bet. Dale and Kent Sts.; cost, $2,700; owner, A. H. Wimkist.

Four-st'y brick block stores and dwells., s s of East Seventh St., bet. Jackson and Sibley Sts.; cost, $10,000; owner, Wm. F. Davidson.

Two-st'y brick church, n w cor. of Eleventh and Pine Sts.; cost, $10,000; owners, Trustees Evangelical.

Two-st'y brick dwell., n s of Delos St., bet. Winslow and Stryker Sts.; cost, $4,500; owner, E. Heinbach.

Five-st'y brick store, w s of Jackson St., bet. Fifth and Sixth Sts.; cost, $25,000; owners, Decoster and Clark.

Two-st'y brick dwell., w s of Pine St., bet. Eleventh and Spruce Sts.; cost, $2,000; owners, Trustees Evangelical.

Two-st'y frame double dwell., w s of Bates Ave., bet. Sixth and Seventh Sts.; cost, $4,000; owner, August Hiedel.

Two-st'y brick store and dwell., s s of Concord St., bet. Susan and Eaton Sts.; cost, $2,100; owner, Charles Franz.

Two-st'y frame double dwell., s s of East Ninth St., bet. Neill and Willius Sts.; cost, $6,000; owner, Julius Austrian.

General Notes.

LEIPSIC, O.—Addition to high-school building; cost, about $3,500; N. B. Bacon, architect, Toledo, O.

NEW HAVEN, CONN. — Permits for 6 unimportant frame dwells., aggregating in cost about $15,000; also, George St., No. 178, brick building, one-st'y, 20′ x 60′; owner, Isaac Hulse.

Brick building, Henry St., cor. Dixwell Ave., three-st'y French roof, 40′ x 40′; frame barn, two-st'y, 16′ x 20′; owner, Casper Kipp; cost, $8,000.

SALEM, O.—Guy Tilden has prepared plans and specifications for the steam-heating and plumbing of the house of Judge J. A. Ambler, to cost about $2,000.

Bids and Contracts.

WASHINGTON, D. C.—The Snead Iron Works of Louisville, Ky., will probably be awarded the contract for the iron work for the library room in the west wing of the State, War and Navy building, their bid being $26,840, about $16,000 less than that of any other.

The War Department has awarded the contract for supplying settees for the public grounds in Washington to the Manly & Cooper Manufacturing Co., of Philadelphia, and has adopted the special design of the company, submitted by them, in preference to its own.

COMPETITION.

MEMORIAL TO GENERAL GRANT.

We offer three prizes of $50 each for the best three "preliminary sketches" of a design for a Memorial to General Grant, to be erected in a large town at a cost not exceeding $100,000.

Conditions: — Drawings to be received at this office **on or before Saturday, September 19, 1885.** Drawings to be at any scale in pencil or ink — no brush-work or color — the scale to be indicated on the drawing. A brief memorandum of material and probable cost to appear *on the drawing itself.*

Each design to be represented by perspective (or elevation) with plan, and, if necessary, section at smaller scale.

Each design to be signed by a motto, and the author's name forwarded under seal. In case of publication, the author's name will be announced, unless request is made to the contrary. The award will be made by a jury of architects and sculptors.

509 EDITORS OF THE "*American Architect.*"

# THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. No. 505.

AUGUST 29, 1885.

Entered at the Post-Office at Boston as second-class matter.

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LA SEMAINE DES CONSTRUCTEURS quotes from M. Durand-Claye a brief account of the present condition of the system in use at Berlin for disposing of sewage. As is well known, Berlin had until within a few years no real sewers, and its entire system of drainage is the result of very recent study and experiment. The site of the city is nearly level, and it lies in the midst of a flat, sandy plain, far from the sea, so that no natural facilities existed either for collecting or disposing of the sewage, and it was necessary to weigh the advantages of all known methods with the greatest care in order to choose the one which would be most effectual and economical. Almost from the first it was decided to dispose of the waste liquids of the city by irrigation, and, although the temptation to reduce the amount of liquid to be dealt with by allowing surface waters to run into the river must have been great, the sewers were finally planned to take all the street washings, as well as house and manufacturing wastes. The natural fall obtainable being very small, it was necessary, in order to secure proper flushing, to divide the area of the city into twelve sections, each having its own net-work of sewers, discharging into separate receiving reservoirs, from which the liquid is pumped into the conduits through which it flows to the purifying fields. The main sewers are constructed of brick, with branches of vitrified pipe, and all portions are ventilated by numerous openings.

THE planning of the irrigation fields seems to have been quite as difficult a matter as that of the sewers. Unlike the purifying tracts of Paris or Edinburgh, the district which the Berlin engineers were obliged to use was not only low and flat, but presented a sandy upper soil about three feet deep, overlying a bed of impermeable clay, which kept the water which fell on the plain close to the surface, making the ground marshy during the greater part of the year. Such ground as this was very unfit for purifying large quantities of sewage, and it was foreseen from the first that unless a large area were used, saturation with foul liquids would soon take place, and the land would become pestilential. After careful investigation and experiment, it was decided that four thousand cubic metres ought to be about the maximum amount of sewage delivered annually on each acre of land. This is a much smaller dose than is usually allotted to sewage farms, and the city authorities were in consequence obliged to secure a considerable territory for its operations. They were prudent enough to do so at the outset, and the irrigation farms now include thirteen thousand acres, or about an acre for every eighty-four inhabitants of the sewered part of the town. Only about half of this is, however, at present under irrigation, the rest being kept in reserve for future use, or as fallow ground to be employed in alternation with the fields now irrigated. As fast as the irrigation pipes are laid, subsoil drains are put in, to maintain the filtration through the soil, and the subsequent aëration, which experience has shown to be essential to success in sewage farming. The outfall from the subsoil drains is into the natural water-courses, which flow sluggishly into the North Sea, and it was found at first that the movement was so slow that the ground became clogged with sewage; but a thorough clearing of the streams, and the removal of the weeds which choked them, soon freed the passage, and the soil is now easily kept in proper condition. We have no details of the mode of cultivation in use on the irrigated land, but it appears that during the last year the cost of caryring on the operations, which has hitherto been done by the city officials, was about three hundred and eighty thousand dollars, and the receipts from sales of produce about three hundred and forty thousand, the deficit of forty thousand dollars representing the cost of disposal of the wastes of nearly eleven hundred thousand people, besides the rainfall and street-washings of a large city. Now, however, the efficiency of the system having been established, negotiations are in progress with farmers for the lease of portions of the irrigated fields, and much of the territory has already been taken up, at prices which will bring to the city an annual profit instead of a deficit.

IT seems probable that the German engineers, using the record of the experience of others with the care and thoroughness characteristic of their race, have succeeded to an unusual degree in securing the benefits usually sought in the introduction of sewerage systems, but one is hardly prepared for such surprising results as those which M. Durand-Claye describes. According to him, the recent health statistics of the city show that in the portions not yet connected with the sewers there has been within a given time, we suppose a year, one case of typhoid fever to nine and three-tenths houses, and one death from the disease in every forty-third house; while in the sewered districts there was in the same time only one case of the fever to forty-nine and three-tenths houses, and one death from it to one hundred and thirty-seven and five-tenths houses. It must be remembered that Berlin is above all others a city of great apartment-houses, the average number of persons to a house being fifty-eight, so that these figures do not in either case show an extraordinary mortality from typhoid fever, but it is remarkable that the simple connection of the buildings with the sewers, without any change in the character of the drinking-water used in them should at once diminish by four-fifths the liability of their inhabitants to the disease. In fact, as the interior portions of the city, which are at once the most crowded and the least wholesome, have been the first to be provided with sewers, while the houses in the suburban circle, where the system is not yet complete, would naturally have fewer occupants, and those of a cleaner and better nourished class, it seems quite possible that a comparison of the numbers of individuals attacked, instead of that of houses, would show a still greater difference in healthfulness between the sewered and unsewered districts.

THE advance of European civilization into Central Asia, with the rapidly growing commercial activity of the region about the Caspian Sea, seems likely to lead before many years to the opening of the interesting country between the Caspian and the Persian Gulf to the labors of archæologists. Something has already been done here, at Nineveh by Layard, and at Persepolis by Victor Place, but the greater part of the field has not even been touched, and hundreds of questions of the greatest importance in ancient history remain to be solved by examination of the ruins which almost cover the ground of Eastern Turkey and Western Persia. An American expedition is, we believe, about to commence operations in Mesopotamia, but it is too early yet to expect results from its labors; and the most recent successful investigations seem to have been those made by a very modest little expedition, consisting of three gentlemen and a lady, which was sent by the French Government to study the ruins of Susa, the rich "City of the Lilies," which, as the capital, first of the Elymæan country, and later, of the Persian province of Susiana, was one of the most renowned Asiatic towns of antiquity. M. Dieulafoy, who directed the work of the expedition, had visited the place three years before, and was impressed with the idea that much lay beneath the uneven surface to reward judicious excavation, and the director of the national museum, M. Ronchaud, agreeing with him in this opinion, availed himself of a favorable opportunity to send him back there, accompanied by his wife, and with a civil engineer and a naturalist to assist him. As usually happens in that fanatical region, the labors of the party were seriously obstructed by the hostility of the people and the officials, who endeavored to prevent any one from working for them; but this gradually diminished, and before the two months of the favorable season were over, the excavations were considerably advanced. The middle of the site of the old city was, as it seems, occupied, after the manner of the ancient Persians, by an artificial hill, about a hundred and fifteen feet high, on which still remain the ruins of the palace of Artaxerxes

Memnon. The top of the mound is covered with earth and débris to the depth of ten or twelve feet, and this mass still retains many fragments, not only of the palace, but of more ancient buildings which stood upon or near its site. The most important discovery made by the party was perhaps that of a portion of the frieze which once encircled the palace. This frieze was of enamelled porcelain, thirteen feet in height, and the portion recovered measured, when put together by the careful hands of the lady, about thirty-three feet in length. Besides this, portions of several bas-reliefs were found, all in enamelled brick, representing personages with black skins, dressed in embroidered garments, and holding the long staff so often seen in Assyrian and Persian sculpture. These black dignitaries seem, according to M. Dieulafoy, to have been of Ethiopian race, and he considers it quite probable that some such family may once have ruled Susiana. Among the smaller objects found were seals, many of which, showing work of very different periods, were thrown up by the shovels of the laborers. One of these, cut on an opal, appeared to have belonged either to Xerxes or to his son Artaxerxes. Nothing of gold or silver was found, Alexander the Great, who is known to have plundered the city, having probably done so with the systematic thoroughness which experience might well have taught him, but a large collection of objects in ivory, bronze, glass and terra-cotta was made; and an enormous bracket capital in stone, similar in shape to those of Persepolis, but about thirteen feet long, was discovered. This was too heavy to be moved without machinery, but suitable apparatus has already been sent out from France, and when operations are resumed, as they will probably be as soon as possible, this, with such other large objects as may be found, will be transported to Paris.

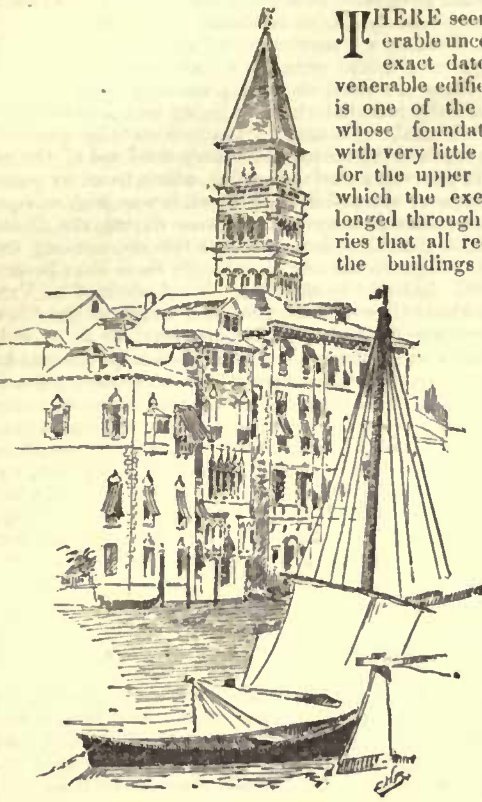
THE Mutual Defence Association, which was definitely formed two months ago among the French architects, has already entered upon its work, and is now pursuing, for the benefit of one of its members, a claim against an official body. The number of members has increased, and the conviction that the work of the Association will be of the greatest service to the profession seems to be steadily growing, one of the local societies of architects having recently been moved to show its appreciation in a sensible way by voting to send ten dollars to be added to the funds of the Association for the present year, "as an encouragement" to an enterprise "of such extreme utility."

THERE is a singular discrepancy between the French and the American accounts of the progress of the Panama Canal, the former usually representing that the work is in active progress, and that everything indicates the speedy and successful completion of the great undertaking, while the latter assure us that only a small amount of actual excavation has been accomplished, and that the canal will soon be abandoned. At this distance it will be impossible to decide which story most nearly accords with the facts, but, recollecting that a good many of the unfavorable predictions which have been made in the New York journals about the canal have been already falsified, we are sometimes inclined to lean rather to the French view of the case. According to this, about half of the labor incident to severing the two continents has already been completed. Much of this, of course, was expended upon the construction of workmen's villages, hospitals, docks and other necessary preliminary works, but these are finished, the surveys have been completed, the line of the canal cleared, and about one-fourth of the material already removed, while contracts have been made for nearly all the rest of the excavation. The plans for the dam which is to turn the course of the Chagres River are completed, and an enormous mass of earth and rock from the summit cuttings at Culebra and Emperador is now in process of transference to the river-channel at Gamboa. The Culebra cutting is under contract to a firm which agrees to remove the material to a depth of two hundred and thirty feet below the summit level. This is about one-sixth of the entire excavation of the canal, but the trench will not even then be deep enough, and it must be dug fifty feet deeper still before it reaches the required grade. It seems from all the accounts that the story once published here, to the effect that the plan of carrying the canal through at the sea-level had been abandoned, and that a number of locks were to be introduced, is without foundation, and except a lock at the entrance, on the Pacific side, to check the rush of the tide through the canal, there will be no obstruction to the course of vessels from sea to sea.

BELGIUM, as is well known, is distinguished for the science of its meteorologists, particularly of the electricians, who have done much to advance the art of protection against lightning, as well as other branches of electrical engineering, by their accurate observations. According to *Le Mouvement Industriel*, some curious effects of lightning upon telegraph-wires have recently been noticed by the Belgian telegraph officials, the account of which is interesting to all who have to do with such matters. Early in June a thunder-shower passed over the province of Antwerp, during which eight posts of a short private telegraph line were struck by lightning, which totally consumed two of them. It was late in the evening, and the instruments in the offices at each end of the line had been grounded, in preparation for closing the day's business, but so slight was the effect upon them that the operators, who were still close at hand, did not notice it at all, and were quite surprised at learning the next day what had happened. That the absence of serious effect in this instance was due to the perfect earth-connection of the wires is indicated by comparison with another instance, occurring on the same day, in which the wire of an electric signal bell was struck, and, although the line was connected with a railway embankment made of cinders, the battery which supplied the current was entirely destroyed. Two weeks later another storm occurred, during which the line between Ghent and Bruges was struck, and several poles destroyed, one of which had been set two years before in the place of another destroyed by lightning in the same way. The discharge passed through the telegraph instrument in the station near by, melting the copper plates on the switch-board, and strangely enough, melting some of the plates connected with wires which ran in the direction opposite to that which led to the scene of the discharge. All the wires coming to the station were, however, gathered into a cable about twenty feet long before entering the building, and as the atmospheric currents would naturally have passed to the ground through the wires which it first reached, without breaking through a layer of insulating material to seek the same destination over another wire, the inference is that their transmission through one wire must have developed an induced current in the neighboring ones of sufficient intensity to melt the copper plates with which they were connected. These occurrences suggested to certain telegraph engineers the propriety of placing lightning-rods on their poles, as well as the usual lightning-arresters on the wires leading into the offices. It was necessary to use the simplest possible means for this purpose, and they made their lightning-rods out of two pieces of telegraph-wire, one on each side of the post, held by hooks driven into the wood, and twisted together into a point above the top of the post. Bits of galvanized wire connected the insulators with the rods, and the lower end of the latter were wound spirally three or four times around the base of the post, for an earth connection.

SO many of our readers are, as we know, addicted to amateur painting in oil, that we need not apologize for quoting from the *Painter* an account of a method for cleaning bristle, camel's-hair or sable brushes upon which color has dried. According to the *Painter*, all that is necessary in such cases is to set the unfortunate brush soaking in kerosene oil for a day or two. At the end of that time the bristles will be found softened and flexible, and, by working on a palette or board, the skin of hardened paint on them can be cleared away, leaving them in good condition for use. Even large house-painters' brushes can be cleaned in the same way, by a somewhat longer soaking in the oil and perhaps a little scraping. The action seems to be due partly to the solvent action of the lighter portions of the kerosene on the gum of the hardened paint, and partly to the softening of the bristles, but both are important, and while we should by no means advise an artist to be so careless as to leave his brushes dirty, with the expectation of cleaning them subsequently, we are willing to extend to the hard-worked and frequently interrupted amateurs of our profession the comfort of thinking that a favorite hog-tool, nicely worn, and of just the right shape and spring, is by no means irrecoverably lost if left a few days with hard paint on it; but that a judicious course of kerosene soaking and subsequent manipulation may restore it to prolonged usefulness, besides imparting to it, if we may believe the *Painter*, a soft elasticity which brushes cleaned in turpentine, however good naturally, do not recover until they have been used for some little time.

THE CAMPANILE OF ST. MARK'S, VENICE.



Venice.

There seems to be considerable uncertainty as to the exact date at which this venerable edifice was begun. It is one of the many buildings whose foundations were laid with very little definite planning for the upper portions, and of which the execution was prolonged through so many centuries that all records or data of the buildings were forgotten long before the superstructures were half finished. In the fifteenth century we know that the tower was in essentially the same condition as it remains to-day. Francesco Sansovino, son of the great Renaissance artist, has left us a large volume in which the various buildings of Venice are described and illustrated as they existed during his lifetime; and assuming his information to be exact, which however, is not a perfectly safe assumption, the foundations of the campanile were laid under Pietro Tribuno, the sixteenth Doge of the republic, in the year 888. Two hundred and fifty years passed, however, before the building rose above the level of the ground; but the upper portions must have advanced with much greater celerity, for we read that in 1329 the architect Montagnana was commissioned to restore the top. There is a rough wood-cut preserved in the library of the Doge's palace, attributed to Albert Dürer which shows the tower as it appeared after Montagnana's restoration. The only way in which it then differed from the present design was in the top, which consisted of an open loggia of wood, surmounted by a low pyramidal roof. This wooden upper story appears to have been several times destroyed. In 1400 while the Venetians were celebrating the election of the Doge Michele Steno, the fireworks started a conflagration which destroyed everything inflammable about the tower. Twice during the fifteenth century the campanile was badly damaged by lightning. On both occasions the wooden top was burned off, and once the thunderbolt tore away the whole north-east angle of the masonry clear to the ground. The extent of the damage done to the campanile at this time can still be traced by the difference in the style of brickwork where the destruction occurred. The only corner of the tower which has not been disturbed by lightning is that towards the south-west, away from the church. It finally occurred to the Venetians that stone would not burn quite so readily as wood, and consequently the present crowning loggia, attic and pyramid were added about 1550. Since then the tower seems to have been little disturbed by thunderbolts, although there are no lightning-rods of any sort upon it.

From its inception, the campanile appears always to have belonged more to the State than to the Church. The foundations were laid one hundred and fifty feet or more away from the Church of St. Mark, as it existed then; and when, during the twelfth century, the superstructure was begun, a ducal decree declared that the tower should belong both to the Doge's palace and to the Church. St. Mark's was then only a parish church, not having risen to the dignity of a cathedral. This joint ownership has always existed; indeed at present there can almost be said to be four owners, as the Prefect, the Archbishop, the Sindaco of Venice and the Chamber of Commerce all have some right in it, and claim a certain jurisdiction.

During the Middle Ages the Piazza of St. Mark was considerably smaller than it is now, as is shown by a large painting by Bellini at the Academy, dating from the close of the sixteenth century. The campanile was then built-about on three sides by a number of low buildings, which reduced the width of the piazza about seventy-five feet, and much interfered with the noble effect. Against the east face of the tower Sansovino had built an open balcony or *logetta*, similar in purpose to the Loggia dei Lanzi at Florence, but much smaller and more graceful in design, though having no part or connection with the huge old tower overhanging it. A few years ago the Logetta was in serious danger at the hands of the too zealous Commission for the Preservation of Ancient Monuments, which began to scrape all the beauty off of the delicately-proportioned members. Fortunately this scraping process was stopped before it was too late, and the restorations at present in progress bid fair to be very satisfactory. The buildings cluttered about the other sides of the campanile were in part removed under the Napoleonic régime, when the piazza was widened, though those at the north side did not finally disappear until about ten years ago.

The present appearance of the campanile is imposing in the extreme, especially when viewed from under the arcades at the farther end of the long piazza. The light work of the Logetta is then completely hidden, and the tower rises in all its simple, lonely grandeur, seeming to dwarf everything about it, and bringing the elaborate front of St. Mark's down to the scale of a child's toy. The tower appears to spring directly from the ground, the few low base-courses being too small to be noticed. The plain brickwork shoots up unbroken for more than one hundred and sixty feet, the sides drawing in slightly towards the top, giving the tower an appearance of being so securely planted that one does not feel the need of the buttressing which would so naturally suggest itself in a Gothic design. It seems like some great, strong giant, standing firmly upright under its load, and ready to face the storms and lightnings of another thousand years. Each side of the tower is marked by the long vertical lines of slightly projected pilasters, ending above with simple stone capitals connected by archings, in each of which is an inverted shell ornament of a type which shows that the uppermost portions of the tower cannot be more than five centuries old. The color of the brickwork is now a dull brownish red. At some period of its history it was covered with stucco, a great deal of which still adheres to the masonry in places. What its color formerly was is only a matter of conjecture, though by comparison with other Venetian work of the same character it seems reasonably probable that the tower was intended to be one bright, dazzling mass of white or light yellow. Certainly it never was red in any shade. We read in the old chronicles of the prisoner of state who was kept for many years in the dungeons of the Doge's palace, and then, when suddenly brought into the mid-day glare of the piazza, was struck blind by the dazzling brilliancy of the surrounding buildings. Had the campanile been a white tower, the piazza must indeed have been dazzling, with the dull white marble and gorgeous mosaics of the church to intensify the glare, for nowhere does the sun shine brighter than in Venice, and even with its present dull tones, the tower is sometimes a trying object to the sight.

Above the brickwork begins the fifteenth-century loggia, open on all sides, built of white and pale colored marbles. Inside are hung the four great bells which strike the hours, and are rung on public holidays. The view from this loggia out over Venice is exceedingly beautiful: there are no high buildings to obstruct the prospect, and the city lies spread out like a map, the long, low island of Lido stretching between us and the sea off to the east, and away to the north and west the line of the mainland, backed by the purple mountains of the Tyrol. From this loggia, too, one can examine closely the details of the campanile, though even in the upper Renaissance portions the details are few and simple, as they should be to chime with the grand simplicity of the general idea. It is noticeable how nicely the parts of the tower harmonize. There is no abrupt termination of the rough brickwork, nor sharp contrast with the white stone above; but the inconspicuous brick pilasters end naturally in the slightly-marked capitals, connecting the brownish lower tones with the plain frieze and boldly projected cornice, so that the fifteenth-century loggia seems to grow out of the twelfth-century substructure. After all, there is nothing quite so effective as good, plain masonry and plenty of it, with a few decisive mouldings. Probably the simplicity of the campanile which seems so admirably balanced now, arose more from barrenness of ideas on the part of the builders than from any studied scheme, but the result is none the less successful. Many of the noblest ideas in art have been evolved by accidental combinations. Surely none of the numerous carefully designed Renaissance towers scattered through Italy can in any way compare with this grand old piece of patchwork. It is almost a wonder that when the bare brick walls of St. Mark's were covered with rare marbles and rich-hued mosaics, the Venetians did not case the campanile in like manner. It would be interesting to know whether such a method of decoration could not be carried out more successfully than it was on Giotto's tower at Florence. Still, one would prefer the plain brickwork.

The best part of the campanile ends with the cornice of the Loggia. The balustrade above with its slender bronze shafts, the high attic with Venice and the lion planted on each face; the steep, green, copper-covered pyramid forming the roof, and the flaming golden angel crowning the summit, are all interesting in a certain way, but seem a little weak as compared with the rest of the building, and hardly serve as a fitting superstructure for so simple a base. Better to have stopped the tower square above the loggia cornice, as was done in the Florence campanile. But then, the Italians never have produced a perfected type of tower termination. This is perhaps the best attempt which has been made, and long acquaintance makes it seem right, even though sober criticism does not wholly approve.

The platform of the loggia is reached inside the tower by an easy ramp, making the ascent in thirty-six turns. The plans and section illustrate the internal arrangement of the campanile, and the manner in which the ramp is built up. The outer walls average five feet in thickness, exclusive of the outer pilasters, and are plumb on their inner faces. Inside the tower are eight great piers about forty-two inches square, extending the whole height. It is interesting to note the manner in which the difficulties of properly supporting the ramp

are overcome. A continuous, inclined barrel-vault would have been impracticable. The plan followed disposes of any thrusts naturally and simply, and has besides the merit of ease of construction. The plate shows a plan and section of the tower which will illustrate this arrangement. There are no ties or anchors in any part of the masonry. A few heavy cross timbers are found built into the outer walls and the inner piers, but these were probably used only during construction, and have generally been cut off so as to form no tie. The only bonding is in the loggia, where the builders did not quite dare to trust the arches to themselves, and as in nearly every piece of Renaissance construction, put two heavy ties in each arch.

The attic is constructed entirely of brick, with facings of white and light-colored marbles. The walls are 70 cm., thick, rather heavy construction for such a height. The balustrade encircling the tower at this level is open all around, the attic setting back 60 centimetres from the face of the loggia. The bells of the tower, weighing in the aggregate 35,000 pounds, are hung from heavy wooden trusses resting on the inner columns of the loggia. The pyramid is also of brick, the outer mouldings being of white marble, while the copper covering is laid over boarding secured to the masonry. The figure of the angel at the top of the pyramid is of wood covered with copper. It is 3.25 metres high, and forms one of the largest single weather-vanes in the world, as it turns on the rod which supports it so as always to face the wind. This vane has been in operation for more than three hundred years, and is still considered very reliable by the Venetians. The rod extends down about seven metres, and is stayed by an arch turned across the interior of the pyramid.

The total height of the brickwork forming the main shaft of the tower is 53.66 metres; and to the top of the cornice of the loggia the height is 62.66 metres. The attic is 9.45 metres high; and the entire height of the campanile from the upper base-course to the auriole around the angel's head is 97.61 metres, as measured by the writer, or 98.31 metres from the present level of the piazza. The building is not perfectly plumb, inclining slightly towards the northeast, in the direction of St. Mark's. It is not an exact square in plan, the dimensions being, at the top of the base course, 12.90 metres by 13.25 metres, and at the loggia, 11.56 metres by 11.724 metres. The attic is 10.320 metres by 10.356 metres.

The most interesting constructional part of the campanile is under ground. Indeed when one considers how heavily the tower is built and bears in mind the treacherous nature of the soil upon which it rests, the question is naturally suggested, What foundations could be sufficient to properly sustain the enormous load? For its area the campanile is one of the heaviest isolated structures in the world, and at the same time the location is about as poor as could be chosen for so weighty a building. The islands on which Venice is built are composed principally of a mucky, alluvial clay, the upper layers of which look like black mud. Deeper down the clay becomes quite firm, though never as stiff as our blue clay. The stratum is of varying thickness, from a few inches to a hundred feet, and lies immediately over a bed of sand which practically has no hard bottom, while it is so full of water as to give little support to piling which may be driven into it. The tide rises freely in the ground everywhere to within a few feet of the surface. On such soil as this is the campanile built. The writer searched in vain through the Venetian libraries for any exact documents relative to the foundations of this building, and was finally obliged to investigate the tower itself, in order to ascertain the conditions under which stability is ensured to the heavy mass. A recommendation from the Archæological Society, an endorsement from the engineer of St. Mark's, a street license from the Sindaco, an approval from the Commission for the Preservation of Ancient Monuments, and a permit from the Prefect had to be obtained before a hole could be started at the northwest corner of the campanile. But Italians are more lenient to strangers than they are to each other, and a little of the red tape was waived, so that the excavation was more than two metres deep before the last permit was made out. After the work was begun, it was ascertained that ten years ago when the last building was removed from the base of the campanile, an excavation was made to determine the nature of the foundations; but all of the masonry was not uncovered, and the observations must have been very carelessly taken, as the results do not in the least agree with what was found by me. A great deal of local interest was taken in the investigations, and some curious ideas were brought forward by a few individuals who could not quite understand why the tower should be enclosed by a high board fence and the piazza half flooded with dirty water. In the course of the excavations a few old cattle bones were unearthed, and one of the papers made it a pretext for statements which drew some interested spectators to the town to see the "*bêtes*" which were said to form a portion of the foundations.

It was also found that several self-styled authorities had evolved from the inner consciousness of their own minds exact data as to the construction and arrangement of the foundations; and one pamphlet which an officious individual persisted in bringing to my notice, had hypothesized a section of the substructure, showing it spreading out in a wide pyramidal form, totally different in every respect from what was really found to exist. The excavation was attended with considerable difficulty, the water working through the loose upper soil, and causing this to wash down so fast that sheet-piling was necessary. Every morning the pit was found full of water, and at least two men were kept at the pumps all day. Believing that this is the first time the campanile foundations have been thoroughly investigated, it seems worth while to describe them in detail, as such construction cannot but be of interest to many architects in America who have to build under exactly similar condition of soil, etc.

The width of foundation uncovered was about one metre. The ground where the excavations were made had been covered by low buildings up to within ten years since, as previously stated, but these had been so effectually removed, that in digging no traces were found of them, though it is doubtful if their foundations could have extended very far. At a depth of 86 centimetres below the level of the present piazza an old pavement was uncovered, which from its position and the appearance of the bricks with which it was laid, was probably a portion of that which was put in place during the fifteenth century. We know that the piazza and all the surrounding buildings have been sinking into the earth ever since there have been any historical records. Indeed the movement is not confined to Venice alone, for a considerable portion of the lower valley of the Po and adjacent streams have been slowly changing level, as is proved at such places as Padua and Ravenna, where old Roman pavements have been unearthed at a depth in some cases of as much as twenty-five feet below the present surface levels. The causes of these settlements I would not undertake to explain, but there can be no doubt that St. Mark's and the campanile once stood much higher than they do now. In the painting by Bellini previously referred to, both of these structures are shown a full metre higher than they are now. This movement has been so even and gradual that only in the course of centuries can it be detected, but when a city is built as low in the water as is Venice, any settlement of this kind may have a serious effect upon the buildings. It must be remembered that the tide rises to within nearly a foot of the present level of the piazza, while during the high tides of spring time the square is not infrequently so flooded with water that the gondolas can come up to the very door of St. Mark's.

The accompanying figures [see Illustrations] show the actual arrangement of the foundations of the campanile. The brickwork of the superstructure, it will be seen, rests directly upon five nearly equal courses of roughly-dressed stone, most of which is hard limestone. Three of these courses show above the present level of the piazza, and constitute all of the visible base. Immediately below these courses is a band of red Verona marble, 12 centimetres of which are above the level of the fifteenth-century pavement. The writer is inclined to believe that at one time the upper limestone courses were faced with marble on a line with the lower marble course, thus making a solid base for the campanile 1.46 metres high, and 64 centimetres wide on top, as shown by the figures here given. This is entirely conjecture, however, as there are no indications of ties or anchors which might have secured such a facing; still a base of this description would add greatly to the appearance of the building, and would be by no means without precedent among just such structures of the same period.

Below the Verona marble were found three courses of Istrian limestone, followed by two courses of a brownish trachite with which were used a few blocks of yellow sandstone and yellow trachite. Some of the limestone bore marks which seemed to indicate that the blocks had been taken from some previously existing structure. Indeed the irregularity of the courses and the diversity of materials employed would lead one to believe that the builders simply utilized whatever material was at hand, without much uniformity of constructive planning. The Istrian stone used is exactly the same in quality as that which the Venetians still employ for foundations: a firm, close-grained material, rather hard to work, and possessing great strength. The masonry of the foundations is all laid in lime mortar of a rather poor quality. The tide-water rises in the ground nearly to the level of the old pavement, hence the work is constantly subjected to the action of salt water. The mortar was found to be much disintegrated, possessing little consistency and crumbling in the hand like hardened mud. The lime for the mortar was apparently made from Istrian limestone of the same quality as that used in the building.

The lowest course of masonry is of green porphyry. The stone uncovered was a fine specimen, being shot through with small white crystals of feldspar and bits of black mica. Why the builders ever selected porphyry for such a place we do not know: perhaps it was cheaper to rob some old building than to send to the main land for large blocks. The course measures 90 centimetres in height, and the individual stones must be very wide, as there was no vertical joint uncovered in the width of the excavation.

No attempt was made to ascertain the nature of the foundations under the inner portions of the tower, but it is fair to assume that the masonry is one solid mass. The work uncovered is in well defined courses of different heights, and the blocks are all more or less carefully dressed to a surface.

The masonry of the foundations was found to rest directly on a platform composed of a double thickness of wooden beams, each 12 centimetres through, placed crosswise over each other. These in turn were borne by the piles, which, so far as could be determined, were driven side by side in continuous rows under the whole of the building. It was of course impossible to find out how long the piles were, but the diameters being on an average 24 centimetres, they probably extended a considerable distance into the heavy black clay composing the soil. The piles seemed to be of oak, and the platform beams of larch, a wood similar to our yellow or hard pine, though all of the woodwork was so thoroughly soaked in water, and blackened with age that it was difficult to determine very much about it. The

platform beams seemed the least well preserved. The wood could be broken off the outside with the hands, though the inside of the pieces was quite firm. The piles did not seem to have deteriorated in the least, but were as sound and tough as sap-wood. Large samples were cut from both piles and platform, but at this writing the water has not sufficiently dried out to say how free they are from rot. It is surprising that the wood has lasted as it has for nearly a thousand years. The water circulates very freely among the timbers, and during the time of making the last metre in depth of excavation, seven men had all they could do to keep the pit clear. The water flowed into the trench only through the timbers of the platform, and was quite clear and salt, showing it came directly from the sea. No wonder under such conditions that the wood should be stained and softened.

An extra row of piles was found driven just outside of the platform, and entirely free from any direct bearing. That the settlement of the campanile has been relative rather than absolute is proved by the fact that the tops of this outer row of piles are exactly on a level with the tops of those which bear the platform. This also shows that the slight obliquity of the tower is due not to any failure of the foundations, but rather to the general movement of the earth, for the tip is towards the side at which the excavation was made, and any derangement of the piles could easily have been noted. The weight coming upon this foundation is something tremendous. The bricks of which the superstructure is laid are very large. One of them which was measured was 44 centimetres by 30 centimetres by 7.5 centimetres, — about ten times the size of our common bricks. The masonry laid up with them will average about 105 pounds per cubic foot. These bricks are so large that they are made with two holes in the centre, by which the workmen can lift them about. Most of the bricks bear a stamp of some sort, and those who have studied the matter are able to tell pretty closely the date of a building by the stamps on the bricks.



Stamp on a Brick of the Campanile.

It was said above that the campanile is one of the heaviest buildings in Europe for its size. The average area of masonry in cross section of the main shaft is 873.74 square feet, or nearly fifty-two per cent of the total area of the tower. Counting the brickwork at 105 pounds per cubic foot, and the stone-work at 150 pounds per cubic foot, and allowing for bells, trusses, etc., the total weight of the tower is in round numbers 13,000 tons, whence the distributed load on the piling is somewhat over six tons per square foot, a load which would cause modern engineers to hesitate a long time before putting upon piles which are simply driven into the clay. The foundations have, however, stood the test of several centuries without yielding an inch; and one of the most valuable results of the investigation has been to fix a maximum of load which can safely be borne under such conditions. It is an interesting question how much the piles really support, for as previously explained, they have no solid bearing, and according to the manner in which piles are usually driven in Venice, could not be relied upon for such a load as six tons per square foot. It is more than probable that their function is simply to hold the clay in one compact mass, the clay itself really bearing the load. Possibly such an hypothesis would explain why the builders added a row of piles entirely outside of the face of the foundations and affording no direct support, with the idea of binding the clay more tightly about the base of the tower. Very similar conditions have existed in our own country. Those who are familiar with St. Louis will remember that under the main portion of the city is a thick bed of blue clay, beneath which is a deep stratum of very soft earth or mud. When the post-office was built, the Government architect decided that the foundations should be sunk very deep, thinking perhaps to gain additional firmness; but the bed of clay was so nearly cut through that when it was attempted to pile for the foundations, the piles penetrated entirely through the clay, and were of hardly any more value for support than the surrounding soil would have been without them. Captain Eads in his report on the condition of the building, expressed as his belief that the only thing which held the foundations was the lateral friction of the piles against the clay through which they were driven, a rather uncertain factor to depend upon for so important a building. In the case of the Campanile of St. Mark, the conditions are exactly the same, except that the builders probably did not drive the piles through the clay. The Venetians have always been aware of the danger of sinking the piles too deep, and in works of which we have definite record, great care has been taken to ascertain the thickness of the stratum before beginning operations; and in some cases where the clay has very little depth the piles are even omitted entirely, for Venice is not altogether built on piles, as is sometimes stated, and the stiff, black clay has been found capable of bearing a pretty heavy load without serious displacements.

In this connection it may be interesting to note the construction of the foundations under the Doge's palace, the data for which were given me by Signor Boni, the architect in charge of the restorations of the palace. The accompanying figure [see Illustrations] shows a section of the foundations under the row of columns facing the sea. The work dates from 1309. Here the layer of clay was probably found to be too thin for piling, consequently the work was begun on what we would term a mud-raft, composed of two layers of heavy larch beams twenty centimetres thick, laid crosswise over each other. This receives directly the six foundation courses of Istrian limestone. This construction is continuous the whole length of the building. A piece of the wood taken from the raft was as sound and firm as a piece compared with it which had been cut only a few weeks.

For more modern Venetian buildings the work of preparing for the foundations is not done as carefully as that which is found under the campanile or the Doge's palace. Piling in Venice is not a scientific operation. Half-a-dozen men supply the power; the drop of the hammer is not more than an arm's length; the piles are driven as closely together as the soil will permit, the interstices filled with fragments of broken stone, and a double layer of planks laid over the whole, on which the masonry is begun. Generally the bases stand pretty well; indeed the results are in appearance more satisfactory than they are in Amsterdam where more care is expended on similar operations.

One does not usually expect to find much of a practical nature in Venice. The climate is so soft, and the surroundings so inviting to idleness; and it hardly seems as though the mild-tempered people who go singing across the piazza could be in any way related to the master-minds who centuries ago built the wonderful St. Mark's, and laid deep the foundations of the campanile. But we find there are practical problems which even Venetian builders are called upon to solve, and a study of Venetian methods may not be without value to sterner New England. C. H. BLACKALL.

A YEAR'S ARCHÆOLOGICAL RESEARCH BY THE GERMANS.[1] — II.



PASSING from the barbarous north to Greece itself, we find that recently much light has come from its ruins to profane, as well as to sacred, architecture. The treasuries, built by different Greek cities to hold their gifts at the shrines of Olympia, known to us only through Pausanius's naïve account, were brought to light by the German excavations from 1875–80. But only very recently has Dörpfeld been able to prove that as the Sicilians sent over by ship the terra-cotta decoration and tiles necessary for the treasury at Olympia, so also the people of Sicyon sent thither from their city blocks of stone, already hewn into shape and marked with their peculiar alphabets, preparatory to building into their treasury. The same keen-eyed architect has happily been able to prove that Scopas's great temple at Tegea was surrounded by thirty-six Doric columns, but had florid details in the *sima*. And it is most painful to hear his report of the destruction going on of the few architectural fragments that remain. What was to be seen in 1880 has now, for the most part, disappeared, the peasants having used it for building purposes. Dörpfeld's study of Philon's recently discovered inscription throws invaluable light not only upon the forms of a great projected naval arsenal, but also upon many details of roofing in Greek architecture hitherto entirely obscure. From the accurate accounts of the mode of construction given in the inscription it seems that the roofing of Philon's arsenal was to be of wood. Over this covering of wood came a coating of clay, which formed a firm bed for the terra-cotta tiles fixed in it, thus making a most complete protection to the perishable wooden beams underneath. It is interesting to learn that the woodwork was not flat, but in order to hold the clay in place, the sloping surface was full of elevations, much as the brickwork of our day intended for a stucco facing. Still, one other fact of great interest for Greek architecture in general is that the rows of pillars of this arsenal did not stand on one united stylobate, but each pillar had its own individual foundation, and this more economical mode of building appears to have been employed even for the interior columns of the Parthenon.

Students of history will hail with delight the discovery of the exact site of the shrine of Artemis, which gave name to one of the greatest naval conflicts of the Persian wars. Few remains have been found of the small Doric temple there, it having been early transformed into a sanctuary of St. George, where, until within a few years, liturgies were sung on the day of that saint. But although little of the ancient Greek structure remains, a knowledge of its exact site is of greatest importance in making more clear our view of the difficulties which the Greeks had to contend against in gaining their glorious victory at the battle of Artemesium.

In the *Mitheilungen*[2] our attention is turned by Köhler to a

[1] Continued from No. 504, page 94.
[2] "*Mittheilungen des Deutschen Archäologischen Instituts in Athen.*" Achte Jahrgang.

somewhat striking discovery in Athens of the fragments of an old grammar engraved on marble. It has always been supposed that before Alexander's time the Greek mind was still so pristine in its creative power that no commencement had been made in the production of works of an introspective and reflective character. It has consequently been said that grammar and kindred sciences, in spite of Plato's mention of a grammarian, must have been the growth of a later day, when, the original creative source running low, men began to ponder on themselves and their speech. But this marble monument, found very recently in the Acropolis, and, by reason of style and shape of letters, dated with great certainty from the pre-Alexandrine age, throws a most welcome ray of light into the midst of these conjectures. Here is preserved to us a fragmentary page of an ancient grammar engraved on a marble tablet. Although it has been made to do some menial service (possibly as a door-sill), and thereby has become much worn, still enough remains to make clear that here the vowels and the division of words into syllables are discussed. This marble was found in the Acropolis, and it may seem strange to us that in the shrine sacred to the goddess it should have been brought to light. As, however, in those olden days in order to introduce a work to the public there was not the now indispensable publisher with elaborate paraphernalia of trade, the writer has led himself to advertise his work in the most public places, and these were the precincts devoted to the gods. Here the public continually congregated, and every new object must have received attention. An additional motive for setting up his work in marble or bronze was doubtless the author's desire to dedicate a portion of his bust as a votive offering to deity in his shrine. Thus did the astronomer Oinopides form Chios, for after completing his important reckonings with regard to the intercalary period, we are told that he had them engraved on a bronze tablet and consecrated to the gods on Olympia. So it seems most probable that some Athenian grammarian put up in Athena's shrine this marble tablet.

Here is another proof of how the ancient Greek life drew vivifying force from the ideals and impulses of its beautiful religion, but of this there have come to us still other speaking testimonials from tombs in the Crimea of the colonists there who drew upon Athens for their art necessities. In one have been found the hangings of an exquisite diadem. But although these are in gold and opaque blue and green enamel, and thus of greatest interest technically, their importance does not rest here. The subject on the superb medallions represents not anything obscure or local, but the head of the great tutelary diety of Athens, the Athena Parthenos by Phidias. In addition, from the richly elaborated gold treasures we learn many details about the master's great chryselephantine colossus, of which it has been impossible hitherto to form a clear conception from the marble repetitions, or from small and much worn coins. In these Crimean medallions not only the beautiful finish given to every part in the golden original seems reflected, but we see also that Athena's owl had a striking place. It is not simply decoration, as hitherto supposed; rather as the goddess's little companion, the bird was perched upon the cheek-piece of the hemlet. From the ancient character of the architecture of the tomb where these beautiful medallions were found Kieseritzky adjudges it to date back as early as the first part of the fourth century before Christ. Thus it is most probable that some goldsmith in Athens copied, even in the age of Phidias himself, the master's great work, then a wonder and delight to all. Copies such as these are doubtless before us in the superb medallions exported to the Crimea, (ancient Panticapæum), where they were laid away in the tomb with some Greek lady, in death as richly decked as in life.

From these full publications of the Archæological Institution light is shown not only upon the intricacies of ancient trade, that medium in the spread of religious symbols and thought, but also on much more at which we can only hint, such as the history of the Greek alphabet, the development of custom, the variety of artistic gifts among different nationalities, etc. But, even though space be limited, we must not omit to refer to the skill of Mommsen and his coadjutors in ferreting out modern falsifications of inscriptions. A certain Dr. Gay published as long ago as 1861 an inscription which he reports having found in Northern Africa near Ben Kedour. He even mentions the dimensions and guarantees the reading he gives. Taken in good faith, this was introduced among other inscriptions from Africa into the great Corpus, and so passed out as genuine among scholars. While, however Mommsen and Hector Pais were recently working at the inscriptions in the Turin Museum they suddenly recognized the original Latin inscription which could have been no other than the one that Dr. Gay had copied and taken to Africa, only altering the word Alpina to Mauritania to suit the inscription to the new land in which he chose to find it. Suspicion rested on still another scholar, one Edmond Blanc, Librarian at Nice, and Hector Pais was sent by the Accademia dei Lincei to compare the inscriptions published by Blanc with the stone originals, in however inaccessible sites they might be hiding. This he did with great fidelity and no little hardship, proving that Blanc was guilty of having not only modified and interpolated inscriptions, but also of having created some out of his own brain. By this untruth on Blanc's part suspicion is now cast upon all that he has published, and his contributions take an unenviable place alongside of those of Ligorio, Pittakis, and their fellows, but science gains by being freed from its most dangerous enemy, an incubus of falsehood. — *Lucy M. Mitchell in the New York Times.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE CASINO THEATRE, NEW YORK, N. Y. MESSRS. KIMBALL & WISEDELL, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print, issued only with the Gelatine Edition.]

We regret that it has not been placed within our power to publish either plans or other drawings, or even a description of this building which we have been given to understand possesses many points of interest. As we have never seen the building except for the few moments required for making the negative for the view published to-day, we can only say that in its construction an unusual amount of terra-cotta has been used, which has enabled the architects to secure a richness of effect that could have been obtained in no other way so inexpensively.

We cannot forbear once more remarking, in face of the fact that this print falls far short of its proper importance and value to the profession through our being obliged to put it forth unexplained by plan or description, how much the editors are handicapped in their efforts to do their full duty to the subscribers through the inexplicable lack of spontaneous co-operation on the part of the profession.

THE TOMBS OR MUNICIPAL JAIL, NEW YORK, N. Y. MR. JOHN HAVILAND, ARCHITECT.

[Gelatine Print, issued only with the Gelatine Edition.]

Had we discovered earlier that certain alterations are now making in this building, under the charge of Mr. Le Brun, we might have obtained other illustrations and information to lend interest to the bald fact that this prison was built about 1834–37. Mr. Haviland was born in England in 1792, and died at Philadelphia in 1852, having emigrated to this country in 1816. He is said to have been, perhaps, the first to use the radiating system in the planning of prisons, of which he built many of the earlier in this country, as, for example, the State penitentiaries for New Jersey, Missouri, Rhode Island, and those at Pittsburgh and Cherry Hill, Pa.

WINDSOR CASTLE, AFTER AN ETCHING BY LUCIEN GAUTIER.

Lucien Marcellin Gautier was born at Aix (Bouches du Rhône), and was a pupil of Gaucherel. He has contributed several etchings to *L'Art.* Among his plates are several views in Marseilles, "The Forum," "Lake Lomond," "The Apse of Notre Dame," "The Cottage," "Windsor Castle" and "The Canal" (after Corot). M. Gautier is a young man, we believe, but has produced some etchings of great merit, and bids fair to win much fame, more especially as an etcher of architectural subjects.

THE CATHEDRAL, FERRARA, ITALY.

The Cathedral of St. Paul, of whose façade Fergusson says that it "stands preëminent for sober propriety of design and the good proportion of all its parts," was begun about the middle of the twelfth and was completed during the following century, though the central portal and some of the sculptures are of still later date. The Renaissance campanile was built in the time of Ercole II.

THE CAMPANILE OF ST. MARK'S, VENICE, ITALY. MEASURED DRAWINGS BY MR. C. H. BLACKALL.

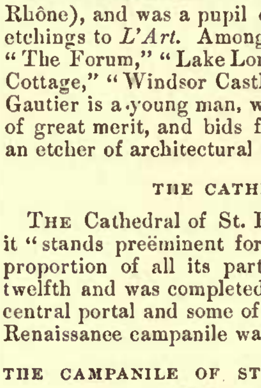
For description, see article elsewhere in this issue.

THE PIAZZA OF ST. MARK'S, VENICE, ITALY.

MARBLE STATUARY ON THE EAST FRONT OF THE POST-OFFICE, BOSTON, MASS. MR. DANIEL C. FRENCH, SCULPTOR, CONCORD, MASS.

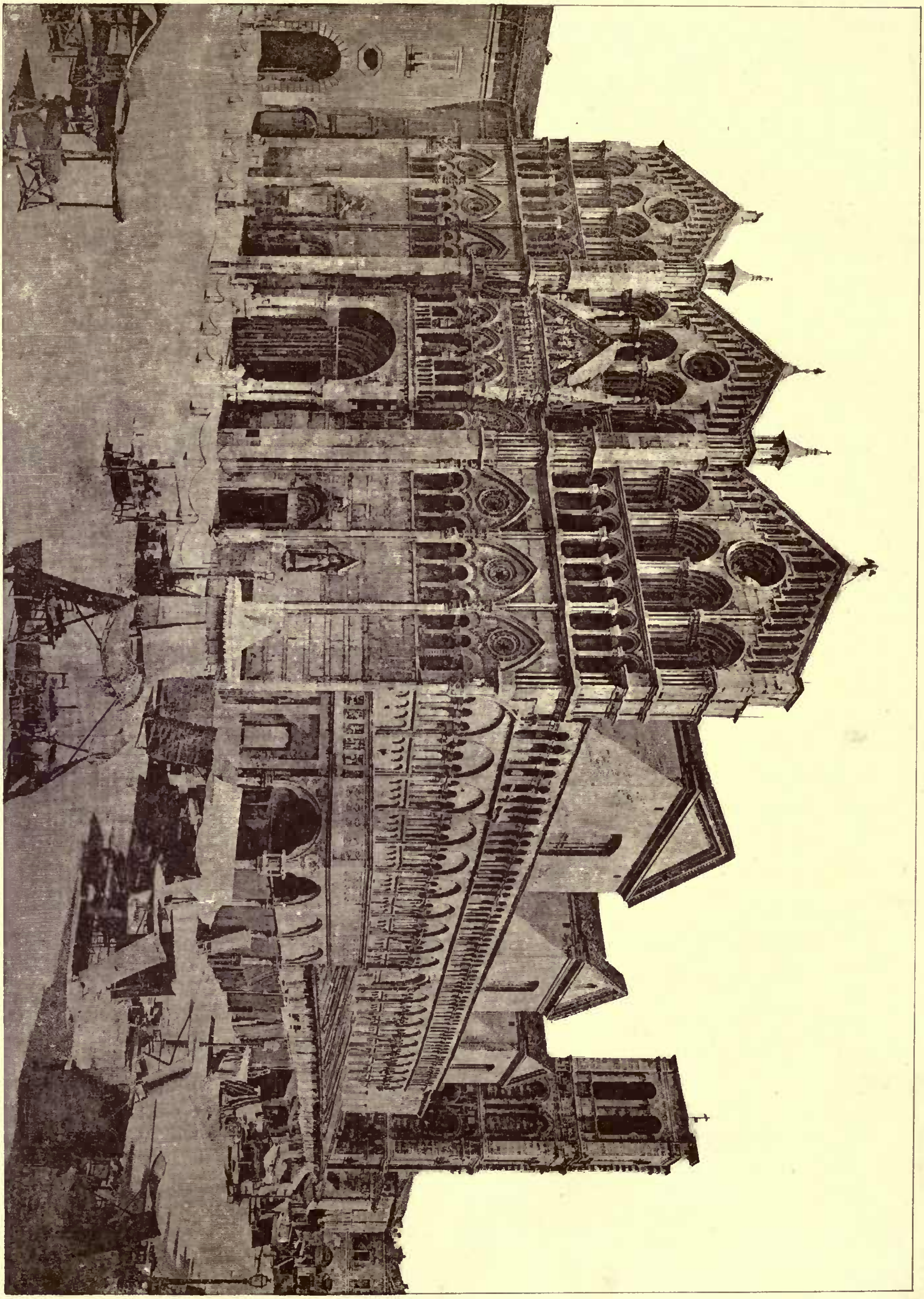
GOSSIP ABOUT SALISBURY.[1] — II.

THE ENVIRONS.



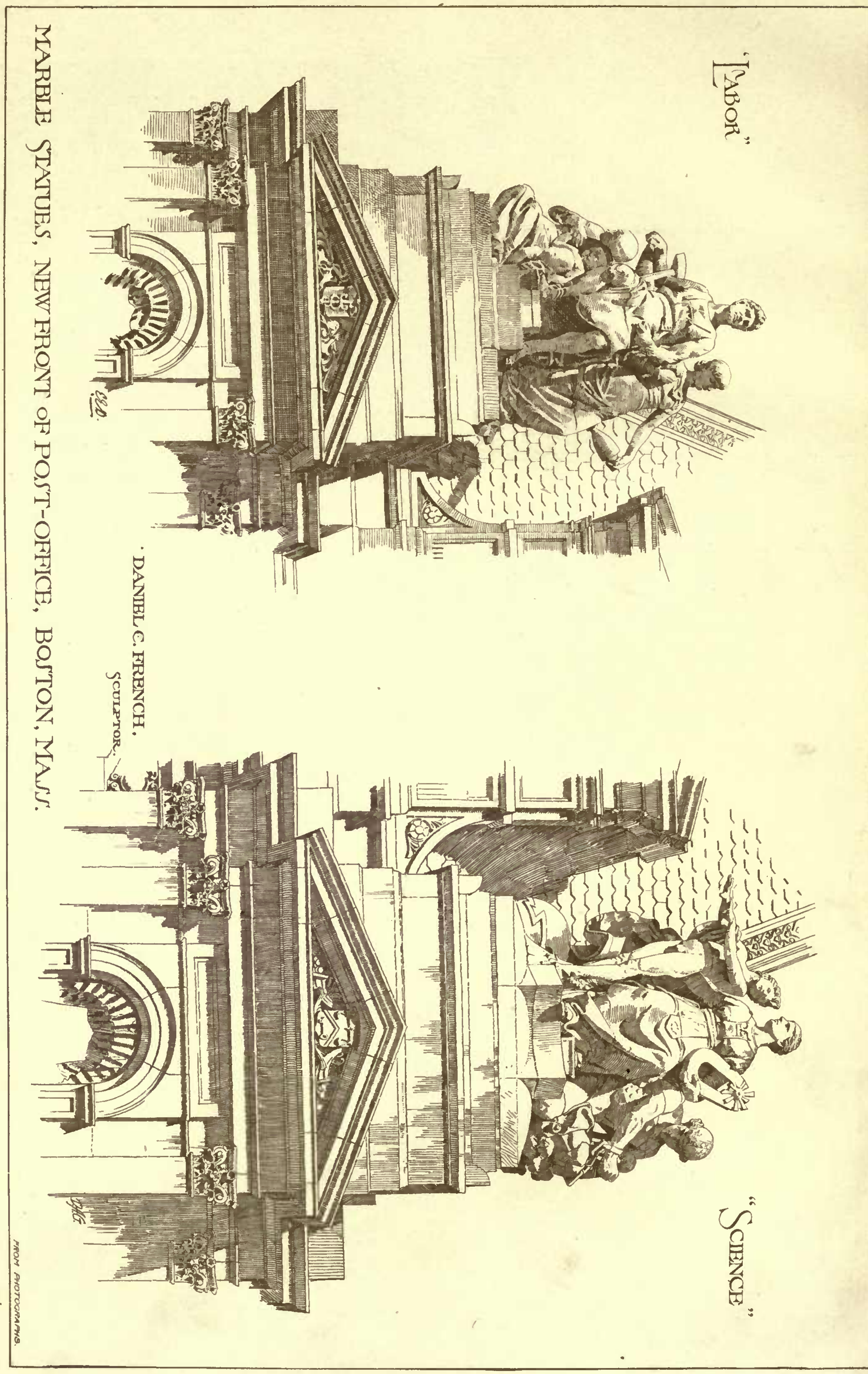
Within easy access from the town, many interesting excursions may be made. The archæologist can visit Old Sarum, Stonehenge and Avebury; the artist, Wilton House and Longford Castle; while the general public can walk upon the sites of many events in early British, Anglo-Saxon and English history. Stonehenge should be visited on a dull autumnal day towards sunset, when the mists encircling the stones lend grandeur and mystery to them. On a bright day, when one sees the enormous stretch of country all around them, one is not impressed by their magnitude. Many are the theories held about them. The first author who mentions them is Henry of Huntingdon, who wrote at the beginning of the twelfth century. In his "*Chronicle,*" he speaks of them as the "second wonder of England," and calls it "*Stanenges.*" Geoffrey of Monmouth, who wrote

[1] Continued from page 66, No. 502.



The Cathedral, Ferrara, Italy.

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MARBLE STATUES, NEW FRONT OF POST-OFFICE, BOSTON, MASS.

DANIEL C. FRENCH, SCULPTOR.

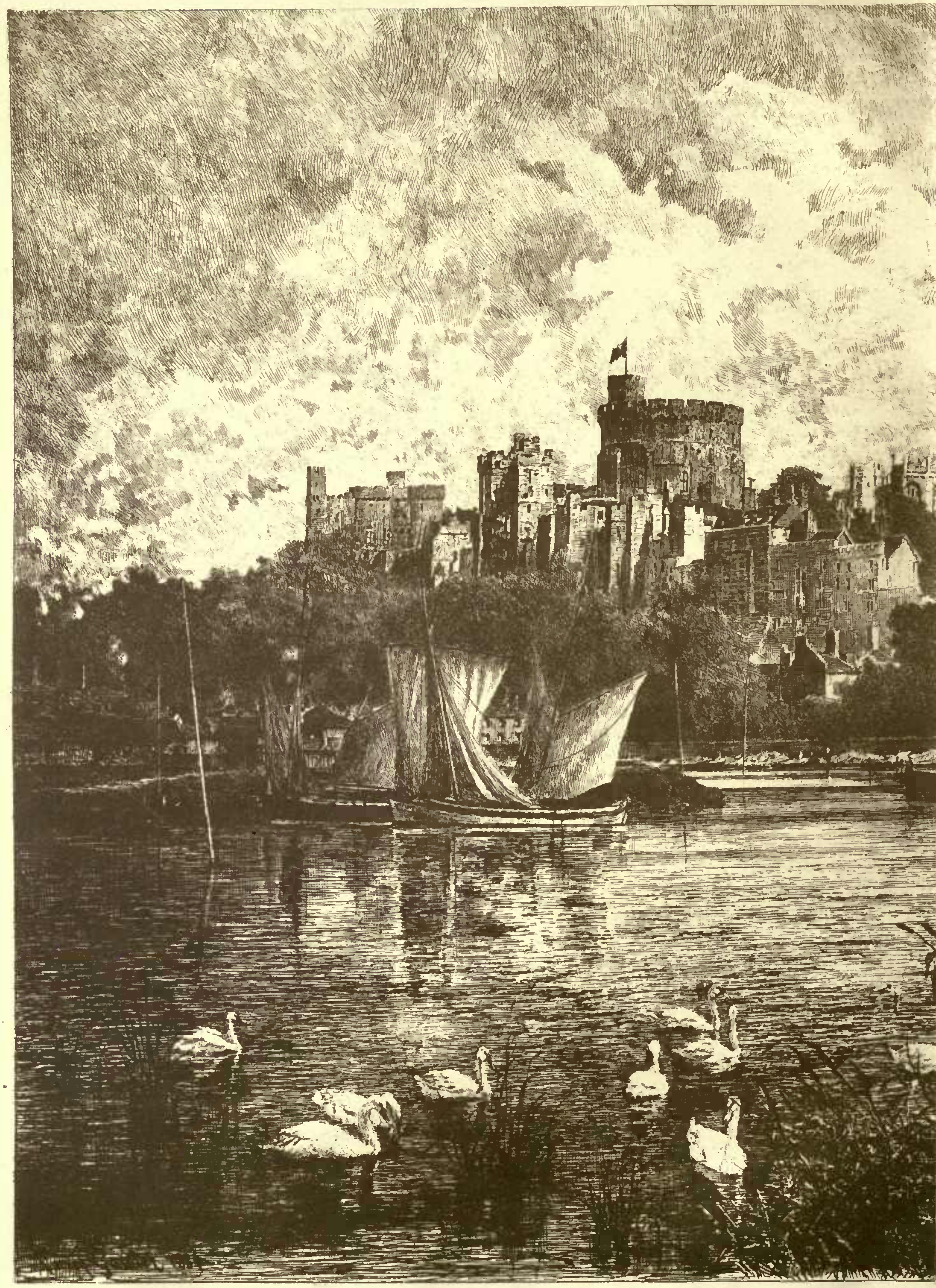
HELIOTYPE PRINTING CO., BOSTON.



THE CASINO THEATRE, NEW YORK, N. Y.
MESSRS. KIMBALL & WISEDELL, Architects.

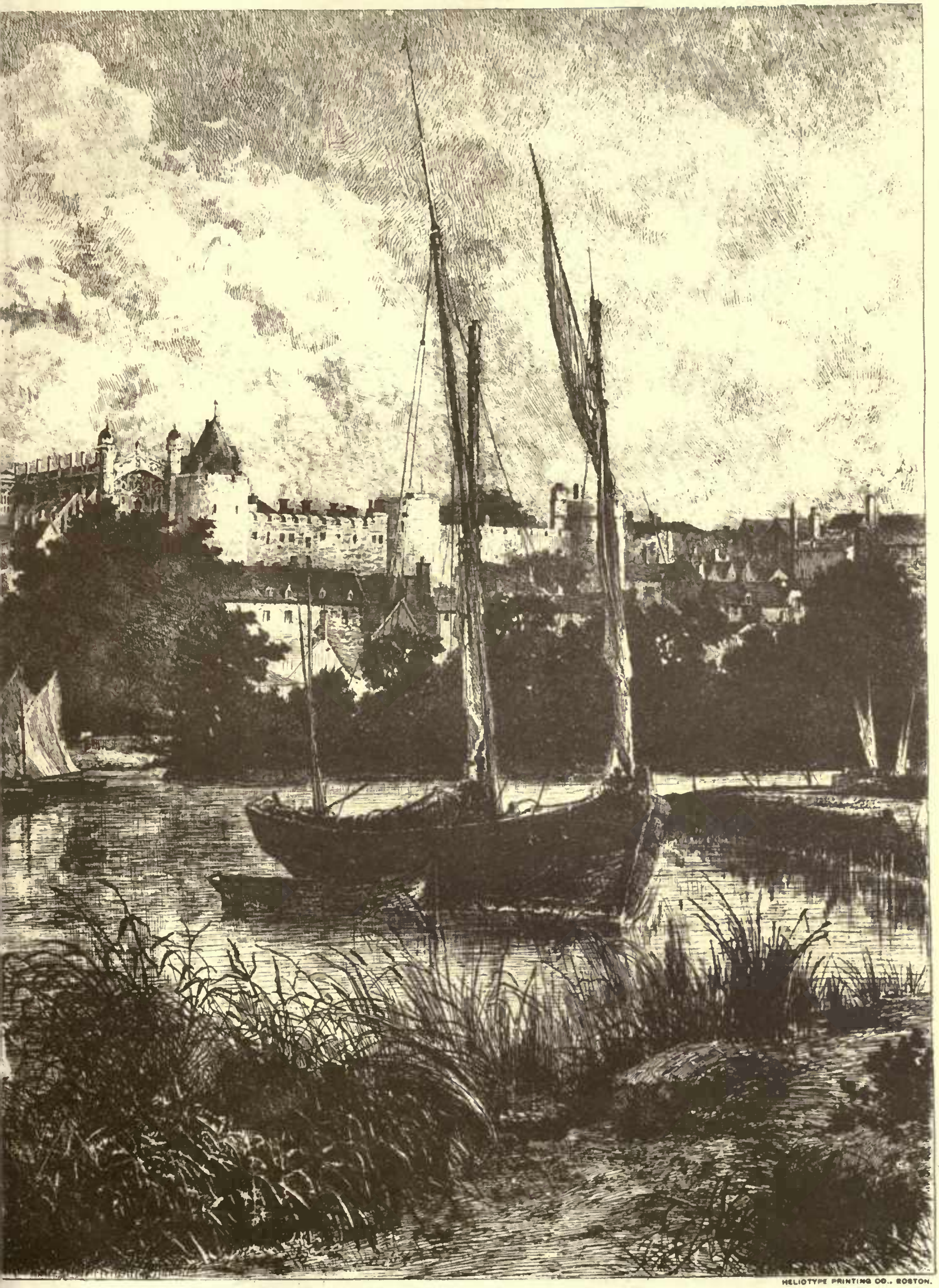
Photo-Gravure Company.

AMERICAN ARCHITECT AND



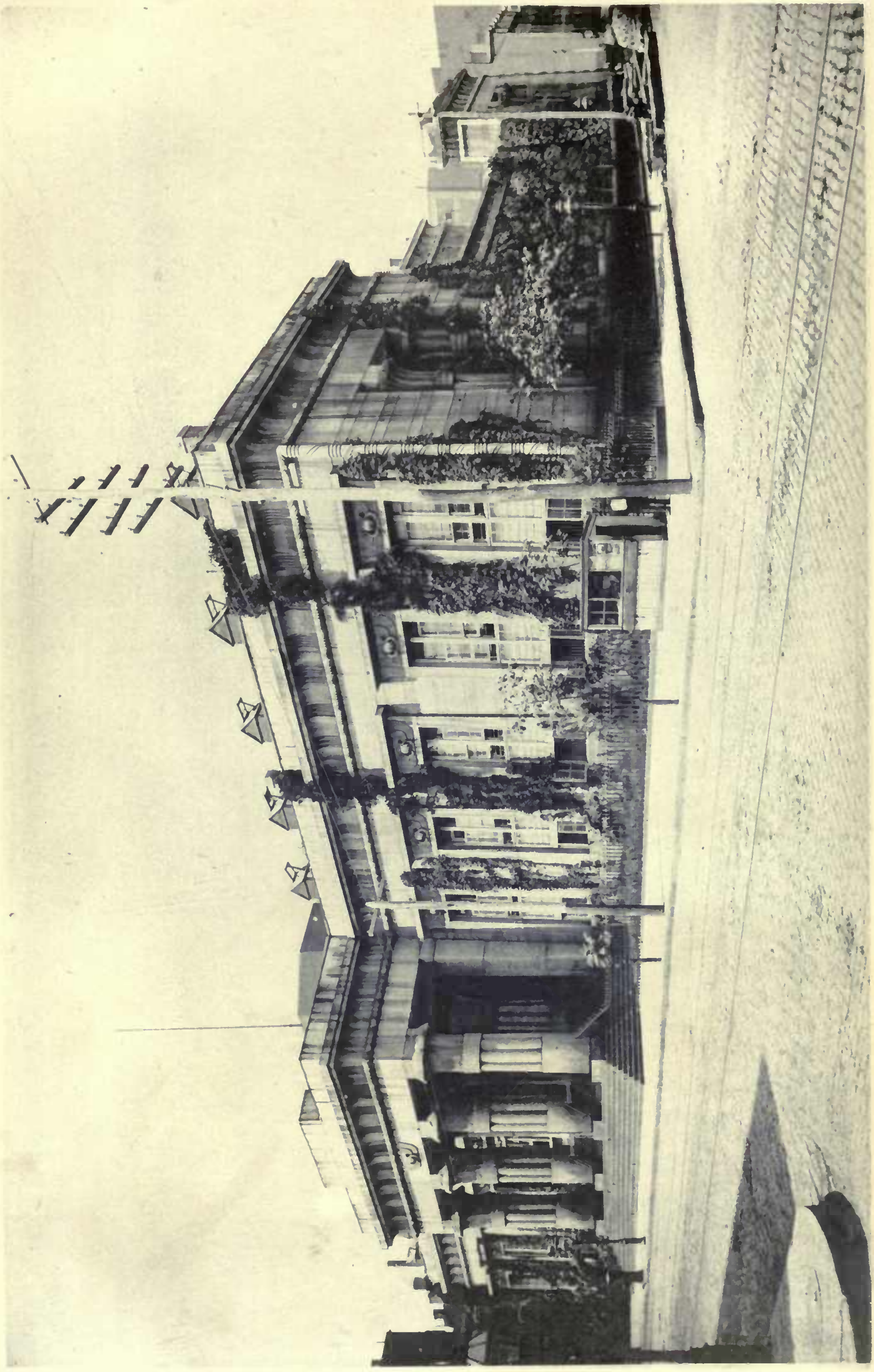
Lucien Gautier del et sc.

WINDS



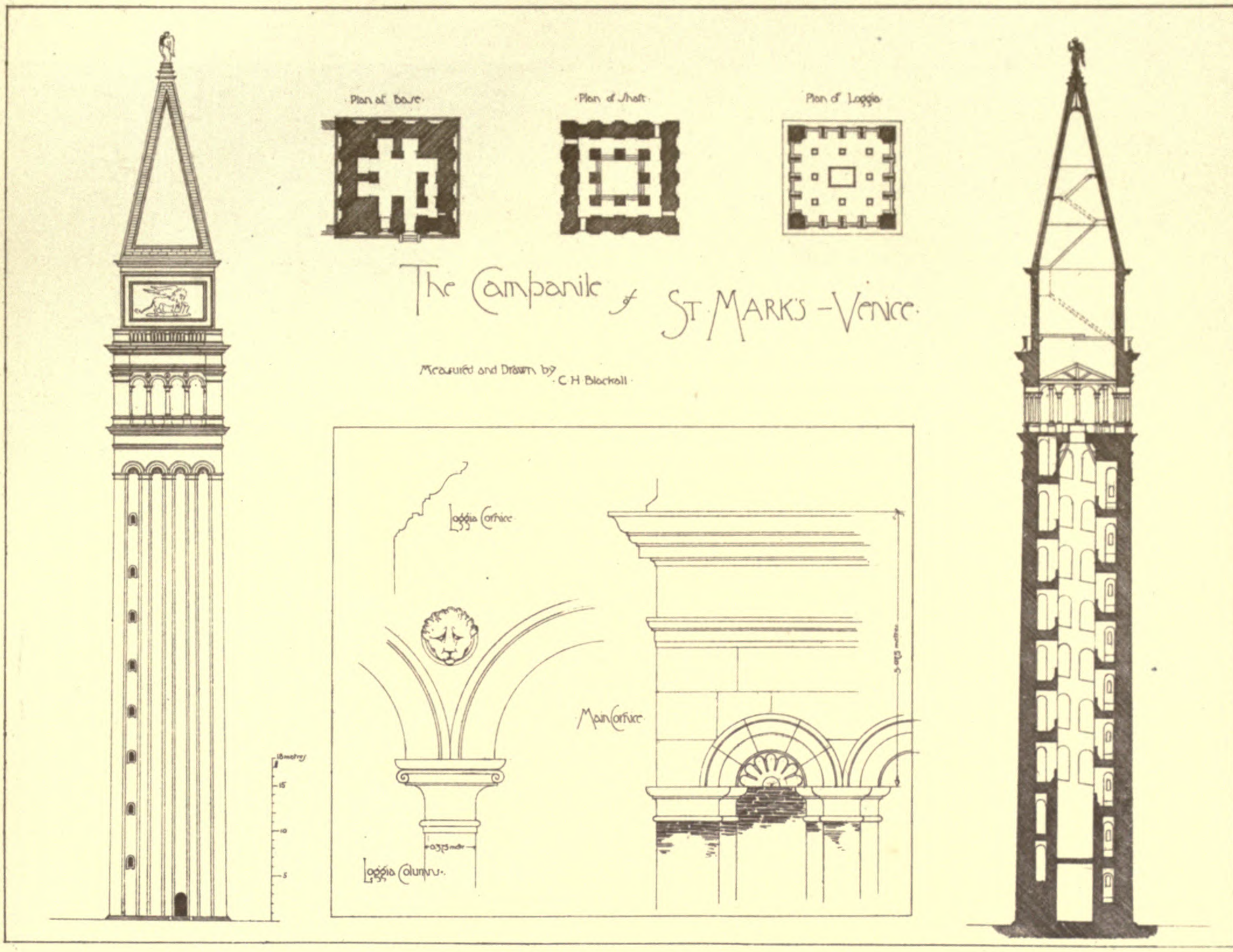
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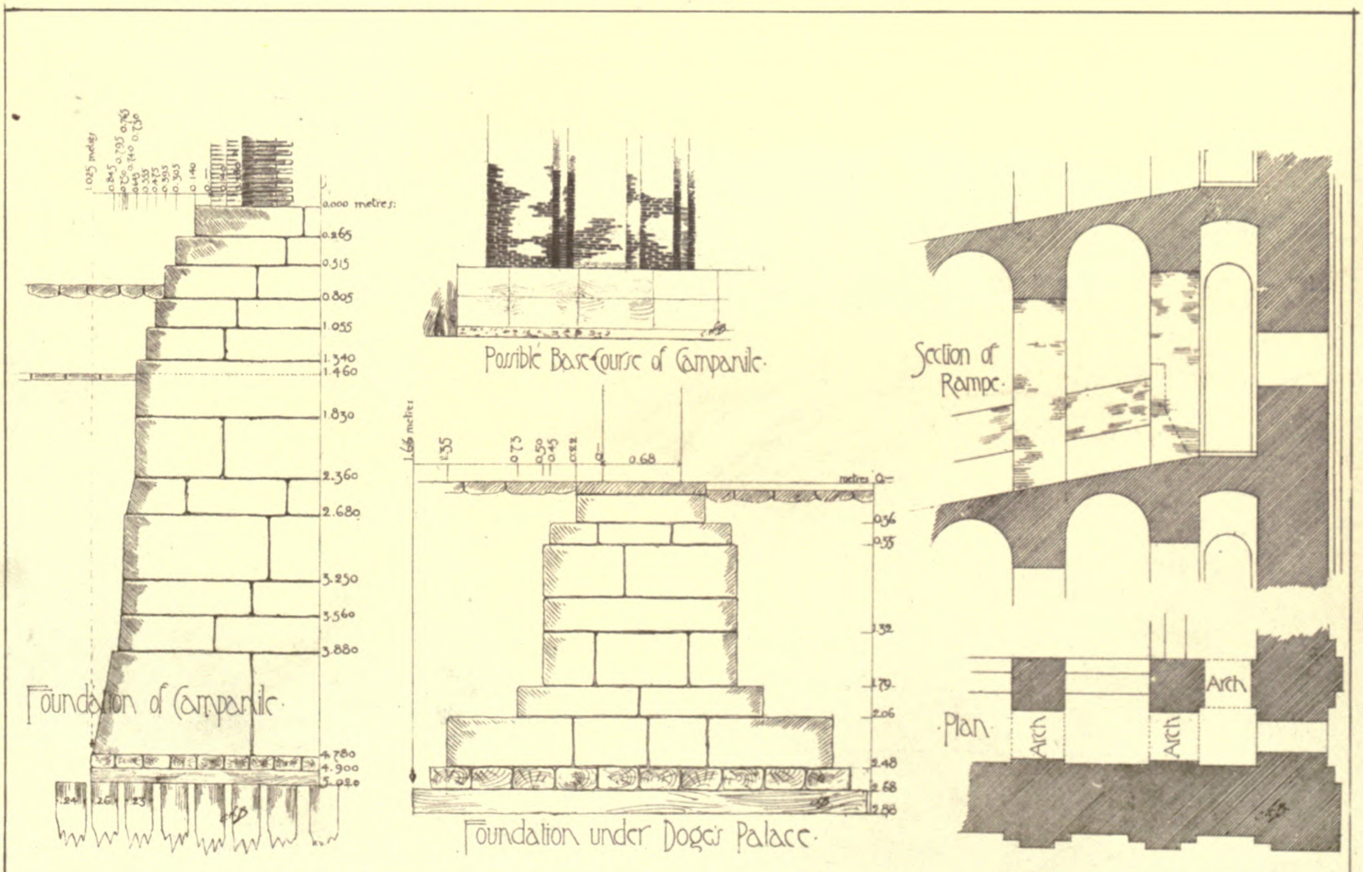
R CASTLE



THE TOMBS, NEW YORK, N. Y.

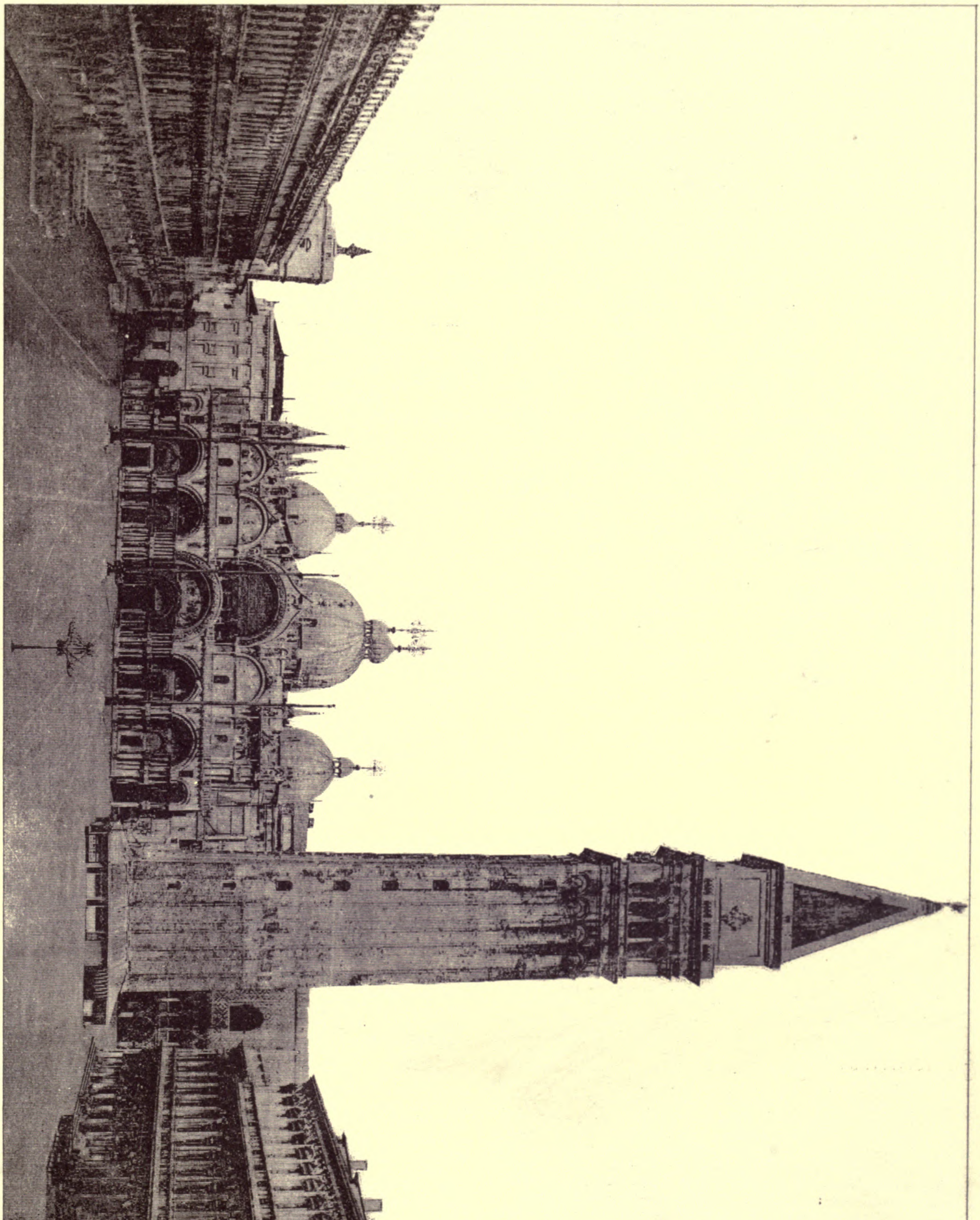
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HELIOTYPE PRINTING CO., BOSTON.

American Architect and Building News Aug. 29 1885 No. 505



The Piazza of St. Mark's, Venice, Italy.

HELIOTYPE PRINTING CO. BOSTON

about the same time, declares them to have been a monument erected in the reign of Aurelius Ambrosius, king of Britain, to commemorate the slaughter of Britons by Hengist; hence the name sometimes given them, "Hengist's stones," but the true etymological explanation of the name seems to be Anglo-Saxon, *stan* and *henge* from Anglo-Saxon, *hón — stone-hanging places.* This seems to prove that the stones were not set up by the Anglo-Saxons. Giraldus Cambrensis (1187) says that they were brought from Africa to Ireland by giants, and that Aurelius Ambrosius caused Merlin to transport them from Ireland to Britain. Inigo Jones broached the theory that it was a Roman temple dedicated to Cœlus, but without the slightest reason, and Mr. Fergusson maintains that they were *post*-Roman, possibly of the fifth or sixth century. Early Christian writers and councils condemned these stone circles, which is probably the reason so few exist; but that they were held in great veneration is proved by the laws of Edgar and Canute in the tenth and eleventh centuries, when they were even looked upon as places of sanctuary. Perhaps the best period to assign to them is the age of Norma, of Lohengrin, of Siegfried and of Tannhaüser. Some of the stones are twenty-five feet high, and the horizontal ones have mortise holes hewn in them which fit onto tenons upon the upright ones.

Old Sarum was a Roman stronghold, and the scene of many a fight between Saxon and Dane, and it was the birthplace of Canute. Of the old cathedral nothing remains, most of the materials having been employed in parts of the new church and other buildings of the neighborhood; but as late as 1608 the walls were still standing.

Amesbury derives its name from Aurelius Ambrosius, a king of the British in the sixth century. "The choir or sanctuary of Ambrosius was probably *the* monastery of Britain, the centre from which flowed the blessings of Christianity and civilization."—*Guest.*

Amesbury, is of interest in legendary history, as being the place of Queen Guinevere's retirement:

. . . . . "but she to Almesbury
Fled all night long by glimmering waste and weald,
And heard the spirits of the waste and weald
Moan as she fled, or thought she heard them moan;
And in herself she moan'd 'too late, too late!'
. . . . . they took her to themselves; and she
Still hoping, fearing, 'Is it yet too late?'
Dwelt with them, till in time their abbess died.
Then she, for her good deeds and her pure life,
And for the power of ministration in her,
And likewise for the high rank she had borne,
Was chosen abbess, there, an abbess, lived
For three brief years, and there, an abbess, past
To where beyond these voices there is peace."— *Tennyson.*

A Benedictine monastery was founded here in 980, by Queen Elfrida, to expiate the murder of her step-son, Edward, at Corfe Castle, but the discipline of the house having degenerated in 1177, Henry II expelled the nuns and made over the convent to the Abbey of Fontevrault, in Anjou (France) whence it received a prioress and twenty-four nuns. It then became a favorite resort of titled ladies. At the dissolution it passed into the hands of the Protector Somerset, and subsequently it belonged to the families of Ailesbury, Boyle, and Queensbury — old Matthew Pryor's

"Kitty, beautiful and young,
And wild as colt untam'd"

lived here, and here Gay wrote his "Beggar's Opera." In his correspondence with Swift, many allusions to it occur. The house was built from Inigo Jones's, or his son-in-law Webb's, designs.

On the road to Wilton, the tourist should stop at Bemerton, George Herbert's home, described by Isaac Walton as the "good and more pleasant than healthful parsonage." Herbert came to live here, upon his marriage, which was arranged and carried out in rather an odd manner. The poet had become acquainted with a certain Charles Danvers who had nine daughters, and a great intimacy growing up between them, Danvers became very anxious that Herbert should marry his daughter Jane. Not having met, they seem to have grown into fast friends and lovers by proxy and through Jane's father, and finally, three days after the first personal introduction, they were married! Herbert then gave up his public oratorship at Cambridge, took priest's orders, and settled at Bemerton. Although to us nineteenth-century Christians, Herbert's sanctity and holiness sounds somewhat overstrained, it must be remembered that his was a time when various religious emotions were influencing men of thought. That the story is true of his being found prostrated on the ground, before the altar in his empty church, vowing to himself "how he would in future manage his life," there is no reason to doubt; nor are we surprised at it when we remember the enthusiasm which kindled the hearts of the Farrar family of Little Giddings, so charmingly related in "*John Inglesant.*" Nicholas Farrar was a friend of Herbert's, and was with him about a month before his death. At Little Gidding the family life was one perpetual prayer, day and night, and the holiness of their lives was so great that they became noted for it. George Herbert seems to have had similar ideas about fasts and feasts, ideas which in those lax times were remarkable, but which in our days, since the Oxford revival, have become the common practice of most church people who think and are consistent. Herbert's lines

"Religion stands a-tip-toe in our land,
Ready to pass to the American strand."

prove this.

The old church contains a fourteenth-century bell, some Decorated windows, and an Early English font. The new church is handsome and was erected to the memory of the poet. But it is the parsonage and gardens which are the interesting witnesses of the poet's residence.

Some two miles beyond Bemerton lies Wilton, a quaint little town, hardly more than a village in size, surrounded by fertile meadows, through which flow endless streams. It is of great antiquity, and as capital of the Anglo-Saxon kingdom of Wessex, gave its name to Wiltshire. It is now only celebrated for its carpet factory, where the best Axminsters are made. The new church erected by Sidney Herbert is an object of interest as being the only building of its style in England. It is Lombardic, having a deeply-recessed, three-porched front, and a separate campanile which is connected with the church by a sort of cloistered passage. It stands upon raised ground and is approached by a flight of steps. The iron-work enclosing the church-yard is copied from the Scaliger tombs at Verona; indeed, all the details are taken from one or another celebrated Italian church. Thus, the columns of the central doorway are twisted, and supported upon the backs of lions, after the manner of those of the Veronese churches. The interior is composed of a nave and two aisles, the former terminating in an apse, with seats for the clergy behind the altar, which stands away from the wall, basilica fashion. The chancel shafts are black marble from Porto Venere, near Spezia, and some of the twisted columns of mosaic-work (*opus Græcanicum*) were formerly in the church of Sta. Maria Maggiore in Rome. The shafts of the nave are stone, and the plain walls above are absurdly ornamented with a sort of sham triforium. Were these niches filled up and the walls covered with frescoes, the effect would be good; as it is, it is bald and poor in the extreme. The pulpit is exceedingly handsome; it is of stone, supported upon sixteen black marble columns with alabaster capitals, the upper part being ornamented with twisted mosaic columns and panels of inlaid marbles. The church contains some good old glass of the thirteenth century, and the two tombs of Sidney Herbert and of his mother, the Countess of Pembroke, are very good specimens of modern work of its kind; but placed as they are on each side of the chancel, they occupy the space which ought to be filled by stalls for the clergy and choir. The whole arrangement of the chancel end of the church is wrong.

But at Wilton it is the house which claims the visitor's attention the most. It occupies the site of the great monastery, founded, it is said, by Alfred the Great, but really by Wulstan, Earl of the Wilsætas; it seems to have been in early times a favorite resort for pseudo-royalties. There is a curious letter extant from Henry VIII to Cardinal Wolsey and Anne Bullen, who had a favorite of proven low manner of life, whom she wished to make abbess. "I wolde not," writes the king, "for all the gold in the world clog your conscience nor mine, to make her a ruler of a house which is of so ungodly a demeanor, nor I trust you would not that neither for brother or sister I should so distain mine honour or conscience." Poor king's conscience, it was not so tender in later years!

The abbesses of Wilton were baronesses of England, an honor shared only by those of Shaftesbury, Barking, and St. Mary's, Winton. Henry VIII gave the land and house to Sir William Herbert, first Earl of Pembroke. It abounds in associations. "Charles I." says Aubrey, "did love Wilton above all places, and came here every summer. By his advice the garden front of the house was built in the Italian style." Shakespeare and his troop are said to have played here in 1603, before King James I, Ben Jonson, Inigo Jones, and Vandyke. Here Sir Philip Sydney wrote part of his "*Arcadia,*" and surely never was place nearer resembling that classic land. Round the house are lovely gardens filled with every kind of flower, and with a background of wooded park, full of deer; every sort of tree is to be seen, from the splendid cedars on the lawn, to the firs, beeches and elms of the upper park. The Italian garden, the Palladian bridge, the statues dotted about, the arched arcades, and the distant view of the cathedral, make up, with the exquisite flowers and the clear running stream, as earthly a paradise of its kind as can be seen anywhere. The house contains some handsome rooms and fine pictures, amongst others some justly-celebrated Vandykes. The largest of these is a family portrait, skilfully arranged and glowing with color. The elegance of the costumes is truly Vandyke, as is the rich color and the beauty of the hands. One is tempted to ask, "did all the people in those days have beautifully formed hands, or did the painter systematically idealize them?" This picture contains ten figures, and occupies one end of a very large drawing-room. There is also a portrait of Charles I in armor, one of the many replicas of the king, and a very good one; also a portrait (less good) of Henriette Marie, his wife and another of the three children, besides others of the same painter. There are some pictures by the great Italians, of inferior quality, and a few very fair ones of the Dutch and Flemish schools. But the glory of Wilton House are the numerous first-rate Vandykes. The principal gateway of the house should be noticed; it is Italian in style, or rather Roman, resembling the Arch of Titus, and has a copy in stone of the bronze equestrian statue of Marcus Aurelius on the Capitol at Rome. Round the inner courtyard of the house runs a cloister filled with antique sculptures brought from time to time from Italy: statues, bas-reliefs, busts, etc.

A longer excursion, some fifteen miles, may be made to Wardour Castle, the seat of Lord Arundel, which lies in the midst of splendid woods. Spring is the best time to visit it, as there are multitudes of

rhododendrons, which when in flower add charm to the park. The old castle, which is now but a picturesque ruin, was built by Lord Lovel in 1393, but through taking the Lancaster side during the Wars of the Roses, it passed away from that family, and ultimately came into the possession of Sir J. Arundel in 1547. During the civil wars of Charles I's reign it was the scene of a romantic episode of history. It was besieged by Sir Edward Hungerford, and Lord Arundel being absent, his wife, with some fifty persons, men and women, withstood the onslaught of fifteen hundred men and a bombardment, during six days. The Lady Blanche was, however, obliged to capitulate, but upon honorable terms, one condition being that "the women should keep all their wearing apparel." But alas for the credit of the soldiers of the commonwealth! no sooner were they in possession than they plundered the house, cut down the trees, and, not satisfied with getting 4*d.* and 6*d.* apiece for them, they tore up the leaden piping which conveyed water to the house, and sold it also. In 1643 the castle sustained another siege, by young Lord Arundel, after his father's death, and Ludlow, who held it for Cromwell, was compelled to surrender. Little remains of the old building but some Perpendicular tracery; and that is much overgrown with ivy. The entrance doorway and one which leads up a staircase are Renaissance. Close to the ruins is a very large and fine tree of the iron oak variety. The original plant was brought from America more than two hundred years ago by Cecil Calvert, Lord Baltimore, whose wife was Ann, daughter of the first Lord Arundel of Wardour. Lord Baltimore was the owner of the colony of Maryland, granted to his father, George, by charter, and it became a settlement of Roman Catholics in 1634. The house contains a few good pictures and a great deal of old Chelsea and other china, ivory carvings, and the celebrated Glastonbury cup, which dates from about 1600, and was made out of the Holy Thorn planted by St. Joseph of Arimathea, hence its name. The body of the cup, which rests upon crouching lions, is carved in relief with medallions representing the twelve Apostles; on the lid is the Crucifixion. It contains two quarts, and originally there were eight pegs on the inside, which divided the ale into equal quantities of half a pint each. The ornamentation of the rotunda staircase, a peristyle of fluted Corinthian columns supporting a cupola, is very refined and elegant. The chapel is in the same style, and is only remarkable for the richness of its altar and silver lamps. It is composed of a verd-antique sarcophagus, surmounted by a slab of porphyry and agate; the columns of the tabernacle are of jasper, and the crucifix is solid silver. In the vestry are some fine vestments, notably the Westminster chasuble, of rich red velvet embroidered with the Tudor rose, the *fleur-de-lys*, and the portcullis and pomegranate; it was made for the coronation of Henry VII.

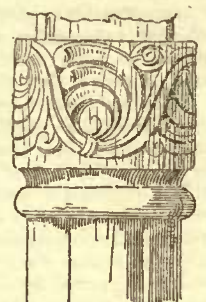
On the road to Longford Castle the visitor may visit Clarendon, the seat of the famous "Constitutions of Clarendon," by which King Henry II, in 1164, alarmed by the assumptions of Becket and the ecclesiastics, sought to settle the disputes, and "to establish thus, with the consent of the whole nation, an English Constitution in Church and State." (*Milman*). Clarendon was the favorite resort of monarchy from the reign of Henry I to that of Edward III. At a later period, in 1356, Philip of Navarre did homage there to Edward III, as King of France and Duke of Normandy; and in 1357, after the battle of Poictiers, the woods were enlivened by much hunting, in which the captive kings of France and Scotland, John and David, rode side by side with Edward to the chase. It was later on mortgaged by Charles I to Chancellor Hyde, who took his title from it; but Charles II unexpectedly paying it off, it was bestowed upon George Monk, Duke of Albemarle.

Longford Castle was built as early as 1591, by Sir Thomas Gorges, whose tomb we noticed in Salisbury Cathedral. The expense was so great driving piles for a foundation into the marshy ground, that he was well-nigh ruined; but being appointed governor of Hurst Castle, he had the luck to see a galleon of the Spanish armada wrecked close to the castle, and to possess himself of some of the treasure, with which he completed his castle. During the civil wars it surrendered to Cromwell, and since then it has been almost entirely rebuilt. Its chief interest is its picture-gallery, which contains some undoubted Holbeins and Velasquez, besides works of other old masters. The portrait of Admiral Adrian Pulido Pareja is alone worth a pilgrimage to Wiltshire, and is one of the finest of Velasquez's works in England. By Holbein are the portraits of Erasmus and Ægidius; by Claude Lorraine, two fine landscapes typifying "Morning" and "Evening," by the landing of Æneas in the Bay of Naples, and the ruins of the Arch of Titus and the Coliseum; by Rubens, a fine landscape of the barren country around the Escurial, but said to be a replica of the one at Petworth. Holbein's "Ambassadors" is curious for the wonderful realism of the painting of the accessories: astronomical and musical instruments, books, and a wondrous foreshortened stuffed fish.

Stratford, near Salisbury in the opposite direction, was the birthplace of William Pitt, Earl of Chatham, probably the real founder, indirectly, of American independence. S. Beale.

Funeral Architecture in Paris. — The most remarkable demand, if it be not a guy, is that made by *l'Evénement*, of Paris, for a reform in the architecture of the morgue, which it now declares is ridiculous and gloomy, and it goes on: —It has nothing Parisian about it, it wants gayety, and is generally unworthy of a city where cemeteries are gardens, funerals festivals, criminal courts places of public entertainment, executions spectacles, and a siege an excuse for a carnival.

BOOKS.


Carved Wood Capital. French. 12th Cen.

The publishing of books of the "*Family Doctor*" type and the manufacture of patent cure-all medicines do not seem to be very seriously prejudicial to the growth and welfare of the medical profession, so there is probably no reason why architects should regard with other than a languid interest the publication of books whose ostensible object is to enable the public to build its own houses, and save to itself that precious five per cent whose salvation is so clearly desirable in the eyes of a great proportion of those who think of building. We look on such works as beneficial, rather than hurtful to the welfare of the profession, as, though they do often enable a man to "build his own house," they more often serve as educators, stimulating inquiry and suggesting doubts and possibilities for whose solution trained assistance is needed, which may be sought at the hand of him who compiled the book, and so bring fruition to the purpose of its publication, or at the hand of some practitioner nearer at hand.

More and more of these books of designs for the less costly kind of dwellings are published every year, each succeeding one improving on its predecessors in some particular, either in merit of design, presentation of the subject or freshness of fashion. In this last particular they are rather interesting, as they show how the latest craze in architectural fashion can be adapted to buildings of various sizes and prices by a designer of some individuality and force, for it takes both of these qualities to conceive and carry into execution such a publication.

Not the least meritorious of these collections is contained in the portfolio before[1] us, which holds a score or so of designs, most of them conceived in what is spoken of by the unprofessional American as the "Queen Anne style," that is, designs which depart from the vernacular in that they are emphasized by scroll-work panels, pedimented window-heads, small-lighted windows, barge-boards, false half-timber work, overhanging gables, marvellously-shaped brackets and piazza posts, and windows of all sorts, shapes and sizes, in ordinary and untoward positions, most of these things wrought in wood and all suggesting to those knowing in such matters the question of repairs. This collection lacks the interest belonging to some others in that it is the work of one hand, albeit a hand sufficiently skilled and well-trained both in design and in draughtsmanship. Still it is very worthy of attention and worth having done as a contribution to the bettering of the homes of our American middle classes, monetarily speaking, for most of the cottages are intended for those who have only a few thousands to spend on a home.

The plates show only the perspective and two floor plans, and for description a simple statement of the supposed cost in round numbers, which in the case of the cheaper houses should certainly be increased by a third or a half. In fact, of these smaller cottages that shown in Plate III seems the only one that could by any possibility be built for the price named, $1,500, and in point of design—the fulfillment of the designer's purpose — it is one of the best. In almost all the others the initial fault lies in the plan, whose eccentric contour — each room insisting on poking an elbow or an eye out beyond its neighbor — is the cause of consequent gambols of the roofs, which play leap-frog with one another while the vertical angles are playing hide-and-seek for the amusement of an overhanging audience of balconies, bay-windows, gables and dormers. This irregularity of outline, which may be taken as typical of the plan of an American house, often results in a more enjoyable and convenient interior than those more formal ones adopted in other countries, but it more certainly leads to a very large increase in the cost, not in the item of material only, but in that of labor. What architect has not impatiently watched the time spent by a careful workman in finishing around some unusual feature which he had introduced to give interest or character, or to distinguish the building from its neighbors, and has not asked himself with sudden misgiving whether after all this particular game was worth the candle? If this collection of designs is put forward to show the author's prowess in designing houses of differing prices, a species of advertisement as it were, or an invitation to him who intends to build to bring his job to the author to carry out, it is arranged with good judgment; but if, as such collections sometimes are, it is intended as a simple book publication, in which the author's only interest lies in the profit from its sale, and if it is intended to supply the wants of those who wish to build without the aid of an architect, the author has, we think, blundered in making his designs so complicated in both plan and elevation. With few exceptions the designs could be vastly improved, and the actual cost of construction be made to more nearly approximate the prices given if they were rigidly simplified.

It is quite useless for any young man to think he can ever become an architect in the fullest sense of the term, if he be a victim of that peculiar mental deficiency which compels him to confess, in spite of every effort, that the science of numbers is to him a sealed book.

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[1] "*The Portfolio of Cottages.* By J. H. Kirby, Architect, Syracuse, N. Y.

The natural inaptitude for mathematics is, we believe, almost impossible to overcome, quite impossible if the victim approaches his tedious task with the slightest doubt of his ultimate success. Still it is necessary that all architects, even those who propose to associate themselves with or employ competent mathematicians, should have an elementary knowledge of the science as it is applicable to the mechanics of building, and any book that can present this information in simple and comprehensible form is a welcome contribution from the expert to the inexpert. Such a book appears to be the one [1] before us, which, though it is avowedly a text-book prepared for school and college use, is one which can be considered as a work on mechanics of direct bearing on practical affairs quite as much as a text-book dealing with theoretical problems. It is a pleasant book, too; admirably manufactured, so that it invites rather than repels the inquirer, while the explanations are given without unnecessary waste of words and yet are happily wanting in that forbidding dryness common to books of its class; in short, we will venture to give the rather ambiguous description of it that it is perhaps the most unmathematical mathematical book we have ever seen. As to its use to the profession, it seems to be an admirable preparation for the study of the larger and more comprehensive works of Professor Thurston on the "*Materials of Engineering*," or of Professor Lanza on the "*Applied Mechanics and Resistance of Materials*," issued by the same publishers.

AS we have a somewhat strong personal belief that one learns more from his failures than from his successes, our feeling that the editor of the *Sanitary Engineer* had an unusually "happy thought" when he conceived of publishing in book-form the answers that have been given in his journal since its foundation, to questions of theory and practice submitted to him, may be more emphatic than the performance really justifies. In this case, however, it is by the failures of others that we are to be enlightened, and we are at liberty to hug ourselves in pharasaical delusion that under the same circumstances we would not have been such fools as the questioners.

The *Sanitary Engineer* has always made a good deal of this department of question and answer, and as it had the good fortune to deal with a science which was just beginning to obtain public notice, it has had an unusual number of questions put to it which cover a wide range of practical matters, and we feel certain that a greater number of readers have followed the exposition of the difficulty, and the solution suggested than usually study the corresponding departments of other journals. They had, too, the satisfaction of knowing that the answers given were not necessarily prepared by the editor himself, but that the questions had been submitted to one or more experts, who either wrote the replies, or gave the editor the necessary points.

Taking the book [2] as it stands, without comparing it with the files of the journal, we should say that the editing had been confined entirely to the selection and arrangement of the material: The answers do not appear to have been rewritten or amplified as they might very well have been, since most of them bear the mark of the conciseness which is compelled by the limited space available in a journal; this is particularly noticeable in some cases where several questions are asked, while only one is answered. Of course many answers which appeared ingenious and satisfactory at the time have been omitted as the advance made in the knowledge of sanitary laws has shown that they were founded on false premises, so that what is given may be accepted as the replies which the editor would give to the same questions if they should be propounded to-day.

The book is excellently got up and printed, and the cuts, of which there are one hundred and forty-six, appear to better advantage than in the journal, while its contents are made readily accessible by a fairly good index. It would be a great improvement, however, if the titles of the several questions had been more judiciously worded: for example, "To prevent Rust in a Suction-Pipe" states neither the point which the questioner raises nor is it considered in the answer. In running over the index we are surprised to find that the working of pumps, concerning which many questions must have been asked, is almost wholly neglected. In like manner we find no notice taken of the perhaps most common question of all: How far from a leaching cesspool must a well be put to ensure safety? But where it is a matter of doubt concerning the connection of pipes and traps, the management of drains, the circulation of hot-water, and many of the inexplicable difficulties which the householder encounters this book may be consulted with a fair chance that some other unfortunate has had a similar ailment cured. The value of the book to the architect is considerably enhanced by the publication in an appendix of the plumbing laws of New York, Brooklyn and Boston.

FOR another useful publication, architects will have to thank another editor, this time the editor of *Carpentry and Building*, who in collaboration with an architect has done his best to prevent the perpetuation of those extraordinary differences in the amounts of the tenders made by equally honest and efficient builders for the same work. The vagaries of the skin-builder and the men of straw it is not worth while to consider, as their bids are generally thrown out, or when accepted it is with eyes open by an architect or owner who pits his shrewdness against theirs, or by a board dealing with public funds: in the first case no one cares which party gets bitten, and in the second it is every one's business, and therefore no one attends to it.

The particular way in which these gentlemen propose to remove or palliate the evil is through the use by the bidders of printed blank schedules,[3] which they can fill up as they figure-out their quantities and make their computations on the separate items of the work they propose to execute, and by so making use of them they make reasonably sure that no portion of the work that architect and lawyer can prove was to be part of the work contracted for by them has been overlooked. These blanks, of course, are kept by the bidder, and are not sent in as the tender itself: they are a superior kind of *aide memoire* which have a value apart from the assistance they give on the job in hand; for, preserved by the bidder, they will form a most valuable reference list which will be found of great service, even if, after having used them for a reasonable time, the builder prefers to return to the old guess-work method of preparing his bid, since instead of saying to himself: "Well, I built just such a house for So-and-so, and it cost so much, my profit was satisfactory, but as prices have gone up ten per cent, I must add ten per cent to the bid I made then," he can refer to the schedule he prepared on that job, and make sure that he is not mixing it up with some other one.

It seems to us that these blanks are likely to be so serviceable that we do not hesitate to suggest that instead of waiting for the builders to learn that there are such labor-saving appliances, and slowly educate themselves into the habit of using them, the architects should take up the matter, and keep a supply of the blanks on hand to be given to every builder who wishes to prepare a bid. In such case it would be possible for the architect to fill up one of the schedules, and so be better able to check-off the bids made, and select the most satisfactory: or he might fill up one in the gross particulars, and use it as a bill-of-quantities which the bidders could copy, and thus be saved considerable time. The specially good points about the blanks are (1) a memorandum of the "data upon which this estimate is based," which includes a list of the drawings, the specifications and the verbal explanations; (2) a copy of the proposal made; (3) a record of the bids of all the competitors; (4) a *duplicate* schedule of timber which can be torn out and sent to the lumber yard as an order: this will certainly help make sure that each piece of timber is received as ordered, and that no piece shall be used for any other part of the work than that for which it was specially required. The bulk of the space is apportioned under the several appropriate headings: excavation, foundation, framing, floors, roofs, doors, windows, etc., so arranged that the cost of each step or feature can be footed-up by itself, a line for "allowance and profit" being assigned to each, and enough blank lines for use in case anything has been overlooked by the compiler or the building have unusual features.

As yet only blanks for an ordinary house have been prepared, but we believe that if they meet with acceptance, blanks adapted to other classes of buildings will be issued. Besides the blanks is a little hand-book giving the necessary explanations and lists of all the work and materials required in building, which if it serve no other use will prevent an architect from forgetting to mention them in preparing a specification.

Of course certain imperfections are to be expected and easily discovered, but it is surprising to find that under "plumbing," the only pipe mentioned is the "soil-pipe," and it is almost as surprising to find that no one is expected to heat his house by steam or hot-water. Still the blanks seem good enough to use, and we think that architects who like thorough work will give them a trial.

NOTES AND CLIPPINGS.

A PAUPER BULWARK FOR GREAT BRITAIN.—The world has changed since Swift's day, and a certain class of humor in which he excelled is not appreciated now. Mr. Pratt, of Covent Garden, has not kept up with the times. All survivals of a past epoch are interesting to the philosopher, and a "long printed document," which this gentleman addressed to the Strand Board of Guardians should be peculiarly attractive to them; but less contemplative souls will not see the jest, probably. Mr. Pratt urges that all deceased paupers should be sent to Herne Bay for interment. A railroad might be built for the purpose. The body, enclosed in a cheap coffin, should be buried in the soft sand of the beach, at a considerable depth, and round it should be neatly laid a bedding of concrete. This material would harden, of course, and other corpses, similarly treated, ought to be placed upon the top, so that in no long time a solid wall of dead paupers, each protected by his covering of concrete, would effectually stop any further encroachments of the sea. Thus in death certain classes of the population might be turned to account, who have, unhappily, failed to do the State service in their lifetime. The Strand Board of Guardians is composed, as it should be, of robust and practical men. They declined, amidst roars of laughter, to debate this proposal, but it may be feared that they did not catch the spirit of it as our ancestors would have done. They made merry, not so much with the fun of the idea as with Mr. Pratt. He will not win fame as a humorist. His suggestion for disposing of dead paupers will not be quoted in all future time as a master stroke of drollery. He was born an age too late. — *London Standard.*

[1] "*A Text-Book on the Mechanics of Materials and of Beams, Columns and Shafts.*" By Mansfield Merriam, Professor of Civil Engineering at Lehigh University. New York: John Wiley & Sons, 1885.

[2] "*Plumbing Problems:*" or Questions, Answers and Descriptions relating to House-Drainage and Plumbing, from the *Sanitary Engineer*, with 116 Illustrations. New York: *The Sanitary Engineer*, 1885.

"[3] *Handy Estimate Blanks*," and the "*Practical Estimator*," being a companion and key to the "*Handy Estimate Blanks*;" containing directions for preparing builders' estimates, together with numerous tables and rules useful in such work. Also a list of all the items ordinarily entering into a building, so arranged as to be a convenient and systematic reminder of the items to be listed. By J. D. Sibley, architect and builder, and A. O. Kittredge, editor of *Carpentry and Building*. New York: David Williams, 83 Reade St., 1885.

The Floor Area of the Philadelphia Post-Office. — The Philadelphia *Call* gives the following measurements of the New Post-Office floor-space: —

Basement, Post-Office	67,000 sq. feet
First floor	67,000 sq. feet
Second floor, Assistant Treasurer	58,000 sq. feet
Third floor, U. S. Courts	58,000 sq. feet
Fourth floor, various offices	51,500 sq. feet
Attic, storage	58,000 sq. feet
Total, 8¼ acres	359,500 sq. feet

Making Lead Sheets by Hydraulic Pressure. — By a German patent, dated May 24, 1884, we see that J. Brandt, of Berlin, proposes to make sheet-lead by hydraulic pressure, in a manner similar to that in use for making lead pipe, instead of by the present method of working down a large block of lead to the required thickness by means of rolls. The receiver for the lead is made of such a length as may be required for the greatest width of sheet which it is proposed to make. The bottom of the receiver is connected to the pistons of several hydraulic rams, and slides up and down in the receiver. A part of the top of the receiver consists of movable jaws, whose distance apart can be nicely regulated by rack-and-pinion arrangement. These jaws being opened sufficiently wide, a charge of molten lead is run into the receiver, and then the jaws are closed to an opening corresponding to the thickness of sheet required. When the lead has cooled to the point which experience shows to be most suitable, the hydraulic pressure commences, and the lead is slowly squeezed out in the form of a sheet. — *Engineering.*

Excavations at Olympia. — The excavations at Olympia are to be recommenced immediately under the auspices of the Archæological Society of Athens. On these excavations the German Government has expended so far a million marks, £20,000 more than is generally supposed, the sums voted by the Reichstag and granted by the Emperor having been supplemented at a later date by a large bequest from an unknown quarter in Berlin. It is declared by those best qualified to judge, that two-thirds of the site of Olympia still remain to be excavated. The Germans themselves, however, seem to be glad to have done with the work, as they have cleared out the principal parts where the richest harvest of *trouvailles* was expected, while nationally they have derived very little profit from the undertaking. They think they made a great mistake in stipulating only for duplicates of what they found, as of course no important objects existed in duplicate. They fancy that nothing of any great artistic value can now be found in the vast area of the Stadium or in the other outlying structures; but the Greek society has determined to clear away the vast mass of superincumbent earth, and to bring back the whole site to the original level, so that the lines of ancient Olympia may be clearly discerned. The local museum, the gift of a patriotic Greek gentleman, is a large building now roofed over, and is being plastered. In a few months it will be ready for the reception of the statues and bronzes already found.—*Athenæum.*

Mount Kearsarge Railroad. — Mount Kearsarge, one of the lesser of the White Mountain range in the State of New Hampshire, U. S., has for many years been a noted resort for lovers of mountains on account of the diversified beauty of the scenery viewed from the summit. Although only 3251 feet in altitude, many travellers prefer it to other of the White Mountains reaching to twice the height; in its outline from some positions it reminds one of Mount Vesuvius. Hitherto it has been scaled by a bridle-path somewhat too steep and slippery on the ledges for horses to be used with perfect safety, reaching nearly to the summit. The construction of a mountain railroad has been commenced. Instead of using the rack-and-pinion system adopted on Mount Washington Railway and elsewhere, or an inclined railway where cars are drawn by ropes pulled by stationary engines, they are to use an ordinary traction railroad of two feet gauge, and by laying it out in the form of a volute, the maximum grade is 265 feet to the mile, and the length of the road will be eleven and one-half miles, or about five times that of the bridle-path. By continually encircling the mountain, a variety of landscape views will be obtained from the trains. Some of the curves are necessarily sharp, the highest curvature being thirty degrees. — *Engineering.*

Removing Microbes from Water. — Professor Frankland has recently made a series of experiments on the relative efficiency of filteration, agitation with solid particles, and precipitation as a means of removing micro-organisms from water. His method was to determine the number of organisms present in a given volume of the water, before and after filtration. The filtrating materials were green-sand, silver-sand, powdered glass, brick-dust, coke, animal charcoal and spongy-iron. These materials were all used in the same state of division, being made to pass through a seive of forty meshes to the inch. Columns six inches in height were used. It was found that only green-sand, coke, animal charcoal, and spongy-iron, wholly removed the micro-organisms from the water filtered through them, and that this power was lost in every case, after the filters had been in operation a month. With the exception of the animal charcoal, however, all these substances even after being in operation for a month, continued to remove a very considerable proportion of the organisms present in the unfiltered water; and in this respect coke and spongy-iron occupied the first place. Water containing micro-organisms was also agitated with various substances in the same state of division as above mentioned, and after subsidence of the suspended particles the number of organisms remaining was determined. A gramme of substance was in general agitated with fifty c.c. of water for a period of about fifteen minutes. It was found that a great reduction in the number of organisms could be produced in this way; and the complete removal of all organisms by agitation with coke is especially to be remarked. Precipitation by "Clark's process" also showed that it affords a means of greatly reducing the number of these organisms in water. Dr. Frankland concludes from his experiments that although the production in large quantities of sterilized potable water is a matter of great difficulty, involving the continual renewal of filtering materials, there are numerous and simple methods of treatment which secure a large reduction in the number of organisms present in water. — *Exchange.*

The London Tower. — In the future, it would seem, the Tower is to be, even more than in the past, one of "the sights o' London." It is to be divested entirely of its utilitarian chapter. The rifles in the Armory are to remain, but the whole of the large store of arms is to be removed to the central depot at Weedon. This, we are told, is in fulfilment of a desire that the Prince Consort had very much at heart — a desire that the Tower should be preserved wholly and simply as a building remarkable for its architecture and for its historical associations. In accordance with this view, the barrack and hospital stores were removed in 1869, and the accoutrements a few years after. The workmen, of course, went also, and now the building will be deserted, so far as permanent tenants are concerned, by all save the small garrison which has always been maintained there. The arrangement will probably meet with general approval. It is, perhaps, as well to separate in this case the practical and the sentimental elements. The maintenance of the useful functions of the Tower means, of necessity, wear and tear, to which it is, no doubt, desirable that the building should no longer be subjected. There is very much to be said for keeping such famous old places as the Tower in as perfect a state of preservation as possible. We can find plenty of localities for the storage of arms, but we cannot adequately repair any damage which may be done to our ancient historical landmarks. We can "restore" them in one sense, but not in another. — *London Globe.*

The First Railroad in America. — In the course of a paper read before the Franklin Institute, bearing the title "Transportation Facilities of the Past and Present," Mr. Barnet Le Van corrects the commonly received statement that the Granite Railroad, built at Quincy, Mass., in 1827, by Gridley Byrant, for transporting stone for the Bunker Hill Monument from the granite quarries of Quincy, was the first railroad built in the United States. On this point he presents interesting testimony to prove that, far from being the first, the Granite Railroad was really only the fourth in order of precedence in the United States. We quote from that portion of the paper relating to the subject, with the simple comment that the statements made by the author are of considerable importance from the standpoint of historic accuracy: "Railroads were also first introduced in Pennsylvania. In September, 1809, the first experimental track in the United States was laid out by John Thompson (the father of John Edgar Thomson, who was afterward the president of the Pennsylvania Railroad Company), civil engineer, of Delaware County, Pa., and constructed under his direction, by Somerville, a Scotch millwright for Thomas Leiper, of Philadelphia. It was sixty yards (one hundred and eighty feet) in length, and graded one-and-one-half inches to the yard. The guage was four feet and the sleepers eight feet apart. The experiment with a loaded car was so successful that Leiper in the same year caused the first practical railroad in the United States to be constructed for the transportation of stone from his quarries on Crum Creek to his landing on Ridley Creek, in Delaware County, Pa., a distance of about one mile. It continued in use for nineteen years. Some of the original foundations, consisting of rock in which holes were drilled, and afterward plugged with wood to receive the spikes for holding the sleepers in place may be seen to this day."

The Purification of the Thames. — Our readers will remember that from time to time we have published accounts of the evidence received and the conclusions arrived at, by the Royal Commission, which was appointed to inquire into the state of the Thames. It was found that last summer the condition of the water reached a pitch of foulness at which the nuisance became unbearable, and the whole riverside population from Greenwich to Erith was more or less inconvenienced by the stink. Those who had to gain their living on the water suffered actual sickness, while the Commissioners themselves were attacked by diarrhœa and vomiting after one of their visits. The state of affairs grew so bad that the Metropolitan Board of Works were obliged to confess that their crowning work was a failure, and sought to whitewash its filth by a plentiful admixture of chloride of lime, which was used to the extent of very many tons a day. All that time the advent of cholera in this country was expected almost day by day, and the calm assurance with which the danger would have been met, owing to the otherwise capital sanitary arrangement of the metropolis, was a good deal shaken by the uncertainty as to what effect the floating mass of filth, regurgitating daily between Blackwall and Erith, might have on the question. It was too late to do anything last summer, but every one felt that at length the time had come when this crying disgrace would be attacked. But we are again at the end of July and the authorities have made no sign, and to all appearance have forgotten that the Commission ever sat. But while officialism has been dozing or sulking, private enterprise has been at work. Mr. Bailey Denton and Lieutenant-Colonel Alfred S. Jones have acquired more than three-fourths of Canvey Island, a large area of 4000 acres reclaimed from the Thames, and separated from the Essex Marshes by Hole Haven and East Haven Creeks. Here they propose to erect purification works, using the solid matter to raise the ground up to high-water mark or higher, and turning out a pure effluent clarified by filteration through the land. They estimate that there is space to bestow the solid sewage matter for 100 years, and much additional ground could be obtained by reclamation if needed. Added to the scheme is an offer to take the sewage from the Metropolitan Board, and deal with it satisfactorily for an annual subsidy of £110,000, or one penny in the pound of the metropolitan rates. At the end of forty years the whole plant and land is to be handed over to the authorities without further payment. This proposal has been submitted to the Home Secretary, and bears on its face the stamp of earnestness and good faith, which should secure it a fair consideration. — *Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

323,898. WINLOW-SCREEN.—William G. Andersou, Boston, Mass.

323,909. BRICK-MACHINE.—Walfrid Burkman, Chicago. Ill.

323,911. WASH-BASIN, ETC. — William J. Cahill, Lenox, Mass.

323,919. ELEVATOR.—Levi Daso, Montpelier, O.

323,921. ANNUNCIATOR. — Charles E. Doy, Denver, Col.

323,924. FIRE-ESCAPE. — Wilhelm A. Evers, Edgewood, Ga.

323,930. CONSTRUCTION OF FIRE-PROOF BUILDINGS.—Rafael Guastavino, New York, N. Y.

323,945. CHIMNEY-TOP.—Davis L. McCaban, Baltimore, Md.

323,989. BIT-STOCK. — William S. Washburn, East Bridgewater, Mass.

323,991. DEVICE FOR HANGING WALL-PAPER. — Albert Wilcox and Eliza B. Wilcox, Maple Rapids, Mich.

323,998. SASH-FASTENER. — John I. Baringer, Waterford, N. Y.

324,011. CLAPBOARD-GUAGE. — Jehiel W. Danly, Attica, N. Y.

324,019. ELECTRICAL ALARM FOR WINDOW-SCREENS.—Henry Garrett, Dallas, Tex.

324,043. APPARATUS FOR MOISTENING THE AIR IN COTTON MILLS, ETC.—Mortimer Sherman, Lowell, Mass.

324,074. HEATING-STOVE. — Marinus Jan Schuurbeque Boeye, Zwolle, Overyssel, Netherlands.

324,077. WINDOW-SCREEN AND VENTILATOR. — John G. Bronson, Chicago, Ill.

324,078. MECHANICAL BOARD-MEASURE CALCULATOR.—Robert H. Bulloch, Savannah, Ga.

324,100. BORING-MACHINE.—John Ernst, Bay City, Mich.

324,106. HEATING AND VENTILATING APPARATUS. —John L. Hamilton, St. Joseph, Mo.

324,121. SCREW-DRIVER. — George F. Kolb, Philadelphia, Pa.

324,144. SAFETY-BRAKE FOR ELEVATORS. — John W. Metz, Manchester, O.

324,147. WATER-COLOR. — Charles F. Nicholson, Rochester, N. Y.

324,149. SHUTTER-WORKER.—Harden Palmer, Everett, Mass.

324,170. TRANSOM-LIFTER. — George H. Sargent, New York, N. Y.

324,172. WATER-CLOSET. — Rockwell Sayer, Chicago, Ill.

324,200. MANUFACTURE OF WHITE LEAD. — Wm. H. Wetherell, Philadelphia, Pa.

324,213. EAVES-TROUGH HANGER. — William H. Berger, Philadelphia, Pa.

324,230. MIXED PAINT. — George T. Clare, Jersey City, N. J.

324,236. MIXED PAINT.—Robert W. Davis, Elmira, N. Y.

324,239. HOT-AIR FURNACE. — Hosea B. Dewey, Milwaukee, Wis.

324,252. SASH-HOLDER. — Abel Haskins, Chicopee, Mass.

324,271. VENTILATOR. — William H. Payne, Camden, N. J.

324,278. REFRIGERATING APPARATUS FOR HOUSES.—Johann and Jacob Stuber, Syracuse, N. Y.

324,293. BATH. — George Booth, Toronto, Ontario, Can.

324,323. COMBINED TRY-SQUARE AND BEVEL. — Leonard D. Howard, St. Johnsbury, Vt.

324,337. HOT-AIR FIREPLACE. — James Philips, Nashville, Tenn.

SUMMARY OF THE WEEK.

Baltimore.

LABORATORY. — E. F. Baldwin, architect, has prepared plans for the Trustees of the Johns Hopkins University, for a four-st'y and basement brick and brown-stone trimming building, 71′ x 117′, with tower 95′ high, to be erected cor. Monument and Garden Sts.; Messrs. William Ferguson & Bro., builders.

BUILDING PERMITS. — Since our last report twenty-three permits have been granted, the more important of which are the following: —

J. D. Taylor, 5 three-st'y brick buildings, w s Pennsylvania Ave., s of Presstman St.

A. S. Adler, four-st'y brick building, n e cor. Eutaw and Clay Sts.

Wyatt & Owens, 24 two-st'y brick buildings, e s Newington Pl., com. s e cor. Baker St.

F. W. Maldeis, 5 three-st'y brick buildings, s s Lexington St., w Calhoun St., and two-st'y brick stable.

W. W. Watts, 14 two-st'y brick buildings, e s Garrett Ave., bet. Beasor and Clement Sts.

Boston.

BUILDING PERMITS. — *Wood.* — *East Sixth St., Nos.* 459–469, 6 dwells., 15′ x 15′; owner and builder, Jas. V. Devine.

Canterbury St., near Austin St., wood-shed, 14′ x 20′; owner, Peter Donald; builder, F. B. McLaughlin.

Sorin St., dwell., 19′ 11′ x 48′; owner, Dr. H. Call; builder, J. Philbrick.

Lincoln St., No. 30, dwell., 24′ x 34′; owner, Chas. E. Rogers; builder, F. H. Perham.

Boylston St., near Centre St., greenhouse, 22′ x 50′; owner, G. F. T. Reed; builder, J. D. Wester.

Unnamed St., from Norfolk St., dwell., 22′ and 26′ x 28′; owner, J. Green; builder, E. A. Carter.

Clement Ave., near Farrington Ave., dwell., 21′ x 30′; owner, Wm. Mullen; builder, W. S. Mitchell.

Wales St., near Harvard St., dwell., 21′ and 22′ x x 41′ 6″; owner, Cheever Newhall; builder, Thomas Hurd.

Spring Park Ave., opposite Burr St., dwell., 28′ x 34′; owner, Henry Brehant; builder, J. R. Bell.

Colden St., No. 28, storage, 22′ x 22′ and 30′; owner and builder, W. B. Quigley.

Brooklyn.

HOUSE. — On Willoughby Ave., a handsome house 40′ x 65′, is to be built for Mr. J. Napoleon Longhi, of brick, stone and terra-cotta; from plans of Mr. C. H. Gilbert of New York.

CLUB-HOUSE.—A large extension is to be built to the Oxford Club; from plans of Mr. John Mumford.

BUILDING PERMITS. — *McDonough St.*, s s, 300′ 1″ w Lewis Ave., 3 three-st'y brown-stone dwells., tin roofs, wooden cornices, cost, each, $0,000; owner, architect and builder, Geo. Rose, 241 Bedford Ave.

Van Buren St., n s, 110′ w Stuyvesant Ave., two-st'y shoe factory, gravel roof; cost, $5,500; owner, William Nagle, 309 Hart St.; architect and contractor, W. H. Doughty; mason, M. J. J. Reynolds.

Greene Ave., s s, 75′ w Patchen Ave., two-st'y brick and brown-stone dwell., tin roof; cost, $5,000; owner, Lucy Berron, 435 Pulaski St.; architect and contractor, Wm. Dawson; mason, W. M. Gibson.

Poplar St., s s, abt. 80′ w Henry St., three-st'y brick tenement, gravel roof; cost, $4,000; owner, D. S. Quimby, Henry St., cor. Poplar St.; architect, J. G. Glover; builder, not selected.

Sixteenth St., n s, 100′ w Sixth Ave., 2 three-st'y brick flats, tin roofs; cost, total, $13,000; owner, James Beith, 274 Fifteenth St.; architect and builder, W. J. Conway.

Greene Ave., n s, 260′ e Sumner Ave., two-st'y frame mansard, brick and terra-cotta dwell., tin and slate roof; cost, $10,000; owner, Isaac C. De Bevoise, 101 De Bevoise Ave.; builders, S. J. Burrows and Marimus & Gill.

Scholes St., No. 202, s s, 200′ e Humboldt St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Math. Keonne, 212 Johnson Ave.; architect, G. Hillenbrand; builders, D. Kreuder and Aug. Wurst.

Van Voorhis St., n s, 160′ e Bushwick Ave., 2 two-st'y frame dwells., tin and shingle roofs; cost, each, $2,400; owner, Wm. H. C. Leverich, 253 Reid Ave.; architect, H. Smith; builder, O. Dennis.

Moore St., No. 56, s s, 175′ e Ewen St., three st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Eva Hess, 90 Seigel St.; architect, E. Schrempf; builders, J. Schneider and V. Ammon.

North Sixth St., s s, 100′ w Fifth St., three-st'y brick school-house, tin roof; cost, $67,000; owner, Rev. Martin Carroll, North Sixth St., near Fifth St., architect, Thos. F. Houghton; builders, J. Rooney and F. G. Turner.

Fulton St., s s, 100′ e Saratoga Ave., 15 three-st'y brick (stone front) stores and dwells., gravel roofs; cost, each, $7,500; owner, architect and builder, J. H. Herbert, 141½ Monroe St.

Twenty-third St., s s, 185′ w Fourth Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner, John Feitner, Twenty-fourth St.; architect, W. Wirth; builders, J. Sorenson & Kolle.

Broadway, s s, 78′ 6″ w Tenth St., 2 four-st'y brick stores and tenements, tin roofs; cost, $16,000; owner, John Harper, 244 South Ninth St.; architect, E. F. Gaylor.

Van Cott Ave., No. 151, n s, 25′ w Kingsland Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,800; owner and builder, Peter Smith, Van Cott Ave., cor. Kingsland Ave.; architect, Th. Engelhardt.

Boerum St., No. 248, s s, 499′ e Bushwick Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,800; owner, Franz Freibig, 246 Boerum St.; architect, Th. Engelhardt; builder, P. Kunzweiler.

Palmetto St., Nos. 103 *and* 105, n s, 400′ w Central Ave., 3 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,200; owner and builder, Mrs. Leah V. C. Naul, 71 Palmetto St.; architect, Th. Engelhardt.

Melrose St., Nos. 164 *and* 166, s s 100′ w Knickerbocker Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,300; owner and builder, Henry Eppig, Central Ave., cor. Jefferson St.; architect, Th. Engelhardt.

Hicks St., e s, 70′ n Harrison St., four-st'y and cellar brick tenement, tin roof, wooden cornice; cost, $5,000; owner and architect, John Reilley, 292 Baltic St.

Decatur St., n s, 140′ w Sumner Ave., 5 two-st'y front and three-st'y rear brick dwells., tin roofs; cost, $26,000; owner, Mrs. Lucy E. Edwards, 12 Verona Pl.; architect, R. H. Holle; builders, W. Bulkley and Miller & Howe.

Tenth St., s s, 395′ e Sixth Ave., 12 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owners, architects and builders, Cozzens & Barton, 177 Stuyvesant Ave.

Hicks St., e s, 44′ n Harrison St., three st'y and cellar brick dwell., tin roof, wooden cornice; cost, $3,000; owner and architect, John Reilly, 292 Baltic St.

Tenth St., s s, 195′ e Sixth Ave., 12 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owner, architect and builder, C. B. Sheldon, 206 Ninth St.

Duryea St., n s, 250′ e Broadway, 7 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,000; owner, Wm. H. H. Glover, 665 East One Hundred and Thirty-sixth St., New York; architect, John Fletcher; mason, J. Hennessey; contractor, J. Fletcher, Jr.

Herkimer St., n s, abt. 80′ e Nostrand Ave., two-three-st'y brick dwells., tin roofs; cost, each, $12,000; owner and builder, Anderson Miller, 1527 Pacific St.; architect, A. Hill.

Forrest St., s s, 72 w Evergreen Ave., six-st'y brick machine-room and storage bins, tin roofs; cost, $15,000; owners, S. Liebmann's Sons, Forrest St., cor. Bremen St.; architect, Th. Engelhardt; builders, A. Hofgesang & Son.

Grove St., No. 24, s s, 174′ 2″ e Broadway, three-st'y frame dwell., tin roof; cost, $4,500; owners and builders, Wm. Kirkland & Sons, 14 Grove St.; architect, F. Holmberg.

Johnson Ave., No. 121, n s, 100′ w Ewen St., three-st'y frame store and tenement, tin roof; cost, $3,500; owner, Fred. Zoeller, Leonard St., cor. Johnson Ave.; builders, F. Stammler and F. Roche.

Lexington Ave., n w cor. Marcy Ave., three-st'y brick flat, tin roof, wooden and iron cornice; cost, $5,000; owner, E. E. Nelson, 207 Hancock St; architect, J. T. Miller.

Putnam Ave., n s, 163′ w Sumner Ave., 9 three-st'y brown-stone dwells., gravel roofs; cost, each, $8,000; owner, architect and contractor, J. C. Bushfield; mason, not selected.

Herkimer St., n s, 450′ e Rochester Ave., three-st'y brown-stone dwell., tin roof, wooden cornice; cost, $5,000; owner, J. Fisher, 811 Herkimer St.; architect, A. Hill.

President St., s s, 75′ w Henry St., four-st'y brick tenement, tin roof; cost, $17,000; owner, H. W. Stearns, 286 Court St.; architect, T. F. Houghton; builders, J. H. O'Rourke and H. J. Smith.

Fulton St., No. 1905, n s, 275′ w Howard Ave., two-st'y frame (brick-filled) store and dwell., tin roof; cost, $3,500; owner, Louis Sturken, Fulton St.; architect and builder, S. Hertlein.

Clay St. to Box St., at point 133′ w Manhattan Ave., one-st'y frame stable on Clay St., gravel roof; cost, $3,000; owner, Brooklyn Cross Town R. R., 585 Manhattan Ave.; architect and contractor, O. L. Chase; mason, G. Stripes.

ALTERATIONS.— *Washington Ave., No.* 361, three-st'y and basement brick extension, interior alterations, etc.; cost, $5,000; owner, James P. Barnet, 270 Ryerson St.; architect, H. Kafka; builders, W. H. Whyte and A. Beinhauer.

St. John's Pl., n s, 100′ w Seventh Ave., one-st'y brick and stone foundation, slate roof, iron cornice; cost, $10,000; owner, St. John's Episcopal Church; architect, J. R. Thomas.

Seventh St., s s, 220′ e Fourth Ave., raised 6′, brick wall beneath, area in front; cost, $4,500; owners, Trustees of Lutheran Church, by H. H. Schmitt, Fourth Ave., cor. Eighteenth St.; architect, H. L. Spicer; builder, T. Bennett.

Chicago.

BUILDING PERMITS.—Mrs. K. Bourke, two-st'y flats, 318 Van Buren St.; cost, $2,500.

J. W. Gehrig, three-st'y store and flats, 318 West Madison St.; cost, $9,000.

J. Schneider, two-st'y dwell., 2440 Lasall St.; cost, $3,000.

A. Doolan, 2 two-st'y dwells., 3144-3146 Rhodes Ave.; cost, $7,000.

M. Papsohitski, two-st'y store and dwell., 3201 Wall St.; cost, $2,800.

Welsh Presbyterian Church, basement; cost, $3,000.

S. G. Rodenschatz, two-st'y dwell., 625 Taylor St.; cost, $4,000.

H. Lampke, two-st'y dwell., 163 Bissell St.; cost, $2,500.

C. Gray, 2 two-st'y dwells. and stores, 289-291 West Chicago Ave.; cost, $7,000; architect, Palmer.

Wm. Bayne, four-st'y building, 163-169 Locust St.; cost, $26,000.

T. Ognen, two-st'y dwell., 1057 Jackson St.; cost, $3,000; architect, W. Thomas.

Mrs. L. Mitchell, two-st'y store and dwell., 79 Eleventh St.; cost, $3,500; architect, Ruehl.

A. T. Ewing, 2 three-st'y dwells., 3743-3745 Ellis Ave.; cost, $5,000; architects, Cobb & Frost.

M. Kratz, three-st'y store and dwell., 2504 Wentworth Ave.; cost, $8,500; architect, J. Frank.

S. E. Tillinghurst, two-st'y dwell., 31 Pratt Pl.; cost, $3,000.

Elvey Bros., 2 three-st'y store and dwells., 918-920 West Madison St.; cost, $10,000.

R. L. Martin, 6 two-st'y dwells., 95-103 Sibley St.; cost, $18,000.

J. Lawler, two-st'y store and dwell., 566 Harrison St.; cost, $1,000.

A. Lehmann, two-st'y dwell., 119 Wilcox Ave.; cost, $4,000; architect, Thompson.

M. Born, two-st'y dwell., 3431 Michigan Ave.; cost, $8,000; architect, L. B. Dixon.

O. C. Heisen, six-st'y office-building, Dearborn St.; cost, $60,000; architect, J. M. Van Osdel.

Thos. Bird, two-st'y dwell., 117 Ohio St.; cost, $4,000; architect, L. G. Quackenboss.

M. Ryan, three-st'y store and dwell., 651 Fifteenth St.; cost, $6,000; architect, J. Killeen.

S. Downey, two-st'y dwell., 357 Marshfield Ave.; cost, $3,500; architect, Klitenich.

H. Giesecke, 3 three-st'y stores and flats, 759-763 North Paulina St.; cost, $24,000; architect, T. Karls.

J. Sinclair, two-st'y dwell., 119 Laflin St.; cost, $5,000; architect, C. Thomas.

S. Manning, two-st'y dwell., 3315 Forest Ave.; cost, $4,000.

E. J. Lehman, 2 one-st'y stores, Wabash Ave.; cost, $5,000.

Studebaker Bros. M'f'g Co., eight-st'y carriage repository, 103-107 Michigan Ave.; cost, $150,000; architect, S. S. Beman.

E. W. Partridge, 7 three-stores and flats, 378-390 Thirty-ninth St.; cost, $28,000; architect, C. O. Gleason.

J. D. Shea, two-st'y flats, 3752 Wabash Ave.; cost, $2,800.

Hennessy Bros., two-st'y flats, 8-10 Cass St.; cost, $2,500.

J. C. Smith, 3 two-st'y dwells., McCallister Pl.; cost, $15,000; architect, J. G. Cochrane.

G. W. Stanford, 3 two-st'y dwells., 233-235 Armatage St.; cost, $7,500.

H. S. Weeks, two-st'y car barns, Flournoy St.; cost, $20,000; architect, J. J. Flanders.

G. Goherz, two-st'y dwell., 91 Kendall St; cost, $2,500; architect, A. Schoof.
J. Uber, three-st'y stores and flats, 940 Milwaukee Ave.; cost, $8,000.
Josephat Association Church, two-st'y dwell., 228 Southport Ave.; architect, H. Wessner.
J. L. Campbell, 3 two-st'y dwells., 936-940 Park St.; cost, $9,000; architect, J. L. Campbell.
A. W. Fischer, three-st'y store and dwell., 691 Chicago Ave.; cost, $4,000; architect, D. Bloedner.
J. C. Anderson, two-st'y dwell., 33 Erving Pl.; cost, $3,000; architect, C. O. Hansen.
D. Cameron, two-st'y dwell., 304 Monroe St.; cost, $5,000; architect, W. Thomas.
J. Clark, additional stories, 249-251 State St.; cost, $25,000; architect, J. J. Flanders.

Cincinnati.

Building Permits. — L. Denning, two-st'y building, Pine St.; cost, $2,700.
Mrs. C. Little, two-st'y building, Kinney and Hackbery Sts.; cost, $6,000.
F. W. Brockman, three-st'y building, Mulberry and Rice Sts.; cost, $4,500.
C. Kassan, three-st'y building, Molton St. and Euclid Ave.; cost, $4,000.
P. Bradley, two-st'y building, Eastern Ave. and Vance St.; cost, $3,400.
J. Groven, three-st'y building, Dayton and Coleman Sts.; cost, $6,000.
Mrs. R. Gaff, four-st'y building, Perry and Plum Sts.; cost, $7,000.
George Beyer, two-st'y frame building, Belvue St.; cost, $2,000.
H. Werdman, two-and-one-half-st'y building, Warsaw Pike; cost, $6,500.
Brockman & Co., two-and-one-half-st'y building, Ohio Ave. and Parker St.; cost, $7,123.
A. Weisenberger, Wheller & Emery; cost, $3,000.
R. Reimbold, two-st'y building, Corvein St. and McMillan St.; cost, $2,000.
S. F. Denton, two-and-one-half-st'y frame building, Locust and Gilbert Sts.; cost, $2,500.
Henry Rudmeyer, two-and-one-half-st'y frame building, New Baltimore Pike and Wayne St.; cost, $2,188.
A. Schnieder, three-st'y building, Wheeler and Clifton Sts.; cost, $2,500.
B. Dannehold, three-and-one-half-st'y building; Brown and Freeman Sts.; cost, $8,000.
Wm. Aseforth, three-st'y building, Race and Green Sts.; cost, $7,000.
L. C. Black, three-st'y building, Alpine Pl.; cost, $6,000.
J. P. Schar, two-st'y building, Westwood Ave.; cost, $2,200.
Jacob Bauer, two-st'y building, Marshal Ave.; cost, $2,500.
F. Ludke, two-and-one-half-st'y building, York and Western Sts.; cost, $2,000.
J. H. Gray, two-and-one-half-st'y frame building, Eastern and Tusculum Aves.; cost, $6,000.
Mrs. E. Euphrat, two-and-one-half-st'y building, Clifton and Warner; cost, $3,000.
F. Otte, four-st'y building, Central Ave. and Liberty St.; cost, $7,000.
H. Werdman, Hopkins St., three-st'y building; cost, $3,600.
Twenty repairs; cost, $13,020.
Repairing permits to date, 653.
Total cost to date, $1,366,673.

Minneapolis, Minn.

Building Permits. — Campbell Brothers, two-st'y wooden dwell., n e cor. East Twenty-sixth St. and Garfield Ave.; cost, $8,000.
A. Hathaway, two-st'y wooden dwell., s e cor. Hawthorne Ave. and Seventeenth St.; cost, $10,000.
City of Minneapolis, two-st'y brick engine-house, s s Holden St., between Highland Ave. and Borden Ave., n; cost, $6,800.
Fred. D. Noerenberg, eight-st'y stone malt-house, n e s Twenty-first Ave., near Twentieth Ave., s; cost, $30,000.
T. Z. Curtiss, two-st'y wooden dwell., s w s First Ave., between East Thirty-first and East Thirty-second Sts., s; cost, $3,000.
Wm. N. Holway, 3 two-and-one-half-st'y stone dwells., s w s West Third St., between Morrison and Twenty-sixth Aves., n; cost, $7,500.
J. M. Griffith, three-st'y brick veneer store and flats, n w s Fifth Ave., between Washington Ave. and Third St.; cost, $4,000.
E. E. & T. A. Whitman, two-st'y wooden dwell., s w s North Irving St., between Superior and Laurel Aves., n; cost, $5,000.
Jonas McCarty, two-st'y double wooden dwell., s w s Third St., between Fourth and Fifth Aves., n e; cost, $3,000.
Mrs. Esther Curtis, four-st'y brick store and office, No. 106 Washington Ave., s; cost, $18,000.
N. Saunders, two-st'y wooden dwell., s w s Hennepin Ave., between West Twentieth and West Twenty-second Sts.; cost, $5,000.

New York.

Apartment-House. — At Nos. 1424 and 1426 Broadway, Mr. D. S. McElroy, proposes to build from designs of Mr. F. T. Camp a fire-proof building to contain flats, bachelor suites and studios; cost about $110,000.

Association Building. — For the Young Woman's Christian Association a building 75' x 101' 3", is to be erected on East Fifteenth St.; from designs of Mr. R. H. Robertson.

Depot. — On the s s Forty-second St., w Lexington Ave., the Forty-second St. and Manhattanville & St. Nicholas Ave. R. R. proposes to build a depot, 100' x 150'.

Flats. — On the w s Second Ave., running from the n w cor. Eighty-sixth St., to the s w cor. Eighty-seventh St., 8 five-st'y flats and stores are to be built at a cost of about $170,000 for the Misses J. & S. Rhinelander and Mrs. Mary A. Stewart.

On the s s Seventeenth St., 100' e Tenth Ave., 2 five-st'y flats, 25' x 75' each, are to be erected at a cost of about $32,000, by Mr. Jno. W. Decker.

Institutions. — "The Laura Franklin Free Hospital for Children," is to be built on the n s One Hundred and Eleventh St., bet. Madison and Fifth Aves.; from designs of Mr. Wm. Shickel; the building will have a frontage of 55', and is to be three-st'y, with basement and mansard roof; Mr. Terence Kiernan has been awarded the contract.

The St. Francis Xavier College on the n s Fifteenth St., bet. Fifth and Sixth Aves., is to have an 80' front extension, two-st'y; built from plans of Mr. W. H. Poole.

Houses. — For the Rev. J. J. Doughty, a four-st'y brown-stone house, 25' x 60', is to be built on the n s Seventy-ninth St., 200' e First Ave.; from plans of Messrs. Babcock & McAvoy.

On the n s One Hundred and Fourth St., and the s s One Hundred and Fifth St., 140' e of New Ave., 6 three-st'y and basement dwells., 16' x 50' each, are to be built at a cost of about $75,000, by Messrs. Anson C. Squier and N. M. Whipple.

Stores. — At 62 College Pl., 2 five-st'y stores, 25' x 100' each, running through to 72 Warren St., are to be built by Philip B. Parker, at a cost of $55,000; from plans of Messrs. Babcock & McAvoy.

Building Permits. — *Jersey St.*, s e cor. Crosby St., five-st'y brick tenement, tin roof; cost, $12,000; owner, Seigmund T. Meyer, 67 Broadway; architect, A. L. Meyer; builder, W. F. Lennon.

Varick St., Nos. 140 and 142, one-st'y brick store, tin roof; cost, abt. $5,000; owner, Trinity Corporation, 61 Church St.; architect and builder, L. H. Williams.

West Thirty-fifth St., Nos. 520 *to* 524, three-st'y brick factory, tin roof; cost, $16,000; owner, John Graham, 354 West Thirty-third St.; architect, Andrew Spence.

Thirty-ninth St., n s, abt. 140' w Second Ave., five-st'y brick tenement, tin roof; cost, about $16,000; owner, Michael Kane, 126 East Seventieth St.; architect, John McIntyre.

Eleventh Ave., Nos. 500 *to* 506, 4 five-st'y brick tenements with stores, tin roofs; cost, each, $13,800; owner and builder, John Totten, 210 West Forty-ninth St.; architect, M. L. Ungrich.

East Seventy-seventh St., No. 429, two-st'y brick church and school, tin roof; owner, The German Evangelical Church, on premises; architect, R. C. McLane.

Seventy-seventh St., s s, 73' w Third Ave., 2 five-st'y brick tenements with stores, tin roofs; cost, each, $13,000; owner, Siegmund T. Meyer, 57 Broadway; architect, A. L. Meyer; builder, W. F. Lennon.

One Hundred and Eleventh St., n s, 150' e Fifth Ave., three-st'y and mansard brick hospital, tin and slate roof; cost, $85,000; owner, F. H. Delano, Red Hook, Dutchess Co., New York; architect, William Schickel.

Alterations. — The Astor Library was closed this week for important alterations to be made.

Seventh St., No. 288, new first-st'y front and internal repairs; cost, $3,000; owner, Gerald Fitzgibbon, 258 Seventh St.; builders, Grissler & Fausel.

West Thirteenth St., Nos. 507 *and* 509, three-st'y brick extension, tin roof; cost, $3,500; owner, C. H. Delamater, 421 West Twentieth St.; architect and builder, J. Farrell; mason, J. Buckley.

East Thirty-sixth St., No. 11, new stone stoop; cost, $3,000; owner, Robert Hoe, on premises; architect, H. O. Avery; builder, D. Campbell.

Philadelphia.

Building Permits. — *Bolton St.*, w of Ridge Ave., two-st'y dwell., 19' x 36'; And. Slinkle, contractor.
Eighth St., n of Huntingdon St., 5 three-st'y dwells., 15' x 52'; Jno. Loughran, owner.
Eighth St., n of Huntingdon St., 4 two-st'y dwells., 15' x 50'; Jno. Loughran, owner.
Mitchell St., e of Martin St., 2 two-st'y dwells., 15' x 44'; C. F. Hardeck, contractor.
Leithgow St., n of Huntingdon St., 9 two-st'y dwells., 12' x 40'; F. E. Hoersch, contractor.
Richmond St., s of Bockius St., two-st'y dwell., 16' x 42'; A. M. Crosta, owner.
South Sixteenth St., No. 1016, two-st'y dwell., 16' x 60'; Isaac Smith, owner.
Ridge Ave., No. 916, three-st'y hotel, 18' x 70'; A. A. Harmer, owner.
Tioga St., w of Waterloo St., 10 two-st'y dwells., 14' x 42'; Theo. Holly, owner.
Girard Ave., w of Fifty-first St., 16 two-st'y dwells., 14' x 37'; Jno. Bateson, owner.
Coulter St., cor. Morris St., 4 two-st'y dwells., 15' x 40'; F. C. Barr, owner.
Nineteenth St., n of Dickinson St., 2 two-st'y dwells., 16' x 46'; M. B. Stackhouse, owner.
Filbert St., No. 1203, four-st'y factory, 16' x 107'; T. Murfrees, contractor.
Bridge St., cor. Walker St., two-st'y dwell., 44' x 65'; stable, 42' x 46'; Jas. C. Doyle, contractor.
Olive St., e of Nineteenth St., three-st'y dwell., 16' 6" x 24'; Samuel Rea, contractor.
Twelfth St., n of Jefferson St., three-st'y dwell., 15' x 70'; J. H. Billington, contractor.
Eighth St., n of Green St., addition to church, 11' x 80'; contractor, same as last.
Clymer St., Nos. 627 *and* 629, stable, 26' x 41'; C. J. Kelly, contractor.
Cumberland St., e of Broad St., 4 three-st'y dwells., 17' x 48', Jos. Stuckey, contractor.
Sharswood St., w of Twenty-fifth St., 3 two-st'y dwells., 16' x 28'; H. Thornton, owner.
Wright St., w of Twenty-fifth St., 3 two-st'y dwells., 15' x 40'; H. Thornton, owner.
Carpenter St., w of Seventeenth St., three-st'y dwell., 16' x 48'; Geo. Barbiere, contractor.
Ridge Ave., s e cor. Montgomery Ave., three-st'y store, 18' x 50'; A. R. Schoch, owner.
Lehigh Ave., near Germantown Ave., three-st'y dwell.; Chas. Bassett, contractor.
Somerville St., near Germantown Ave., 3 two-st'y dwells.; contractor, same as last.
Nicetown Lane, e of Twenty-second St., 12 three-st'y dwells.; Geo. W. Beabon, owner.
Twenty-seventh St., n of Columbia Ave., 9 two-st'y dwells.; Jacob E. Ridgway, owner.
Nineteenth St., cor. Hamilton St., factory; John Manderson, contractor.
Lambert St., s of Tasker St., 7 two-st'y dwells.; Wm. Ellsus, owner.
Oakford St., w of Twenty-first St., 10 two-st'y dwells.; H. R. Coulomb, owner.
Second St., n of Arch St., four-st'y store; Benj. Leech, owner.

St. Louis.

Building Permits. — One hundred and one permits have been issued since our last report, thirteen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —
A. Worthage, three-st'y frame dwell.; cost, $3,300; J. W. Havens, contractor.
G. S. Bulkley, three-st'y frame dwell.; cost, $3,500; G. S. Bulkley, contractor.
J. B. Woestman, 2 two-st'y stone dwells.; cost, each, $4,500; H. C. Brinkmeyer, contractor.
John Hines, two-st'y brick store and dwell.; cost, $2,500; P. Tolck, contractor.
W. Wahlers, two-st'y brick store and dwell.; cost, $7,000; H. Ellerman, contractor.
H. Rohlfing, two-st'y brick dwell.; cost, $2,500; contractor, same as last.
J. Loesch, 3 adjacent two-st'y brick tenements; cost, $4,500, Dorr, contractor.
P. Ennis, two st'y brick dwell.; cost, $3,000; P. J. Meagher & Sons, architects; contract sub-let.
H. Almstean, 2 adjacent two-st'y brick dwells.; cost, $4,700; Louis Weber, contractor.
Fred W. Podmore 4 adjacent two-st'y brick tenements; cost, each, $3,000; Fred W. Podmore, contractor.
John Schultz, three-st'y brick tenement; cost, $8,500; Bothe & Rotmann, contractors.
Wm. Keane, two-st'y brick dwell.; cost, $4,000; contract sub-let.
J. L. Etzkarn, two-st'y brick dwell.; cost, $3,800; Taylor, architect; P. Richers, contractor.
Joe C. Prichard, two-st'y brick dwell.; cost, $5,500; Aug. Beinke, architect; J. H. Keefe, contractor.
W. B. Morgan, 2 adjacent two-st'y brick dwells.; cost, $3,800; W. B. Morgan, contractor.
J. Mahon, 2 adjacent two-st'y brick dwells.; cost, each, $11,000; J. Mahon, contractor.
John Ferrara, 3 adjacent two-st'y brick tenements; cost, $4,700; H. W. Rocklage, architect; S. Walter, contractor.
Wm. Graham, two-st'y brick store and dwell.; cost, $3,000; Wm. Graham, contractor.
M. Barklage, 4 adjacent two-st'y tenements; cost, $6,500; Henry Snedhoelter, contractor.
J. C. Morrison, two-st'y brick dwell.; cost, $5,000; J. C. Morrison, contractor.
John Herl, 2 adjacent two-st'y brick dwells.; cost, $3,400; Thos. Knittel, contractor.
A. Ausman, two-st'y brick flat; cost, $4,450; F. Bonny, contractor.
William Whittinger, two-st'y brick dwell; cost, $4,300; Wm. Whittinger, contractor.
Mrs. Kennel, two-st'y double brick tenement; cost, $3,250; contractor, same as last.
C. Kamper, two-st'y dwell.; cost, $3,250; Wm. Whittinger, contractor.
M. Obrecht, two-st'y brick dwell; cost, $3,250; contractor, same as last.
Mrs. Kennel, two-st'y brick dwell.; cost, $3,300; contractor, same as last.
W. J. Gerritgeo, two-st'y brick dwell.; cost, $2,500; Kluthe & Boeke, contractors.
C. Valleroy, two-st'y double brick tenement; cost, $2,700; Thomson & Valleroy, contractors.
Future City Oil Works, two and three st'y brick oil refinery; cost, $7,000; J. F. Rivers, contractor.
R. B. Lyle, two-st'y brick dwell.; cost, $6,500; J. B. McElfatrick & Son, architects; S. H. Hoffmann, contractors.

St. Paul.

Building Permits. — Two-st'y frame double dwell., e s of St. Paul Street, between Somerset and Olmstead Sts.; cost, $5,000; owner, Wm. Richardson.
Two-st'y frame block of dwells., s s of Fifteenth St., between Canada and Broadway; cost, $4,000; owner, Harvey Hill.
Two-st'y brick dwell., cor. Minnesota and Ninth St.; cost, $5,850; owner, Lilly M. Des Menil.
Two-st'y frame dwell., w s of Albion St., between Waltham and Seronia Sts.; cost, $3,250; owner, O. L. Rheaume.
Two-st'y brick block of dwells., w s of John St., between Grove and East Tenth St.; cost, $16,000; owner, Catherine Darragh.
Two-st'y frame dwell., e s of Albion St., between Feronia and St. Anthony; cost, $3,000; owner, Miss Anna B. Osborn.
Two-st'y frame dwell., e s of Albion St., between Feronia and St. Anthony; cost, $2,800; owner, Chas. Long.

COMPETITION.

School-House.] **[At Nashville, Tenn.]**

The Board of Public Works and Affairs of Nashville, Tenn., solicit designs for a school-building, to be erected in the western part of the city, and will furnish to any one applying therefor a printed slip containing all information desired. Designs must be delivered by **September 1, 1885.**

BOARD OF PUBLIC WORKS AND AFFAIRS.

505

Memorial to General Grant.

We offer three prizes of $50 each for the best three "preliminary sketches" of a design for a Memorial to General Grant, to be erected in a large town at a cost not exceeding $100,000.

Conditions: — Drawings to be received at this office **on or before Saturday, September 19, 1885.** Drawings to be at any scale in pencil or ink — no brush-work or color — the scale to be indicated on the drawing. A brief memorandum of material and probable cost to appear *on the drawing itself.*

Each design to be represented by perspective (or elevation) with plan, and, if necessary, section at smaller scale.

Each design to be signed by a motto, and the author's name forwarded under seal. In case of publication, the author's name will be announced, unless request is made to the contrary. The award will be made by a jury of architects and sculptors.

509 EDITORS OF THE "*American Architect.*"

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 506.

SEPTEMBER 5, 1885.

Entered at the Post-Office at Boston as second-class matter.

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IT is quite enough to give enthusiasm a chill, this reputed intention of the New York Grant Memorial Association to raise one million dollars for the monument it hopes to erect, and certainly enough to make one recall how rare is the man or body of men that can be safely entrusted with one million dollars which are to be converted into a monument that in more than mere brute expensiveness shall justify the outlay. The structures in this country that have been designed with the foreknowledge that there was a million of dollars to spend on the work could be easily counted — if indeed there are any — and not one of them is a monumental structure. Few can picture to themselves what or how large a structure can be built for such a sum, and the few who can do so can probably keenly appreciate the gravity of the possibility of erecting a mere discordant mass,— overloaded with frittering details, to the use of which the designer was invited by the necessity of expending one million dollars, — instead of a monument which in true art value shall fairly represent the money, and which there are so few capable of designing. As a unit of measurement showing how much in actual mass and how much in architectural and decorative treatment could be accomplished with this magnificent sum, we suggest that the committee and others consider the pedestal of the Statue of Liberty, which will probably cost less than one-third of the sum it is now proposed to raise. To be sure it is safe to reckon that ten per cent of the sum will be wasted, as usually happens where committees undertake such work, and that another ten per cent or more will be absorbed by salaries, experiments or what not, so that there will only be three-quarters of a million to spend on the monument itself, and by so much will the city be saved from the possibility of perpetuating a too overwhelming failure. By the time this is read perhaps one tenth of the desired sum will have been raised, and if the appeals which the Association is now making to the country at large which assert that their endeavors are of "true National character and importance" are heeded, the other nine-tenths may in time be raised. But we advise all people outside of New York who desire to contribute to the Nation's monument to General Grant to wait until Congress meets, for it is only probable that steps will be taken at once to erect a national monument at the Nation's capital.

WE have seen it stated that funds are being raised at nine different places to erect as many memorials, but we have noticed only the subscriptions at New York, Philadelphia, Chicago and Fort Leavenworth. Still it seems likely that those who take part in our own competition, which closes in another fortnight, will find that their endeavors may be appreciated in one or another of these places. Meanwhile editors and correspondents are busy making suggestions as to what character these monuments should have, — suggestions which to the instructed have their amusing side. For instance, the Springfield *Republican* advocates the arch because it is "the most permanent of all structures raised," and in support of this says that there were "over twenty arches in Rome," and settles the question of the permanency of arches by ingenuously recording that "two have stood to this day"! while a Kansas lady recommends that the pedestal be "a triangular temple of iron, paper and stone," which she thinks would be "entirely modern." For our part we have only two suggestions to make, one that when the moment comes to raise money for the Nation's monument the united assistance of the fourth estate be secured, the editor of every newspaper in the country being made *ex officio* a member of the soliciting committee, who on one and the same day shall urge their readers to make each his contribution before night closes. If Congress will enact that the sum so raised shall be doubled out of the National Treasury there would probably then be in hand quite enough to do honor to the memory which all desire to perpetuate. The second suggestion we offer to the New York Association. If it be their intention to accomplish something worthy, unique and lasting, let them abandon thought of mortar, stone and bronze, and consider that they have quite within reach an unparalleled opportunity of taking advantage of the handiwork of Nature. Hewn out of the living rock on the face of the Palisades a unique and creditable monument could be created, whether, after the manner of the rock-temples of India, a structure of architectural lines and forms, or like the Lion of Lucerne a sculptor's creation only, or a work where sculptor and architect could combine their skill in fashioning a colossal sculptured frieze perhaps five hundred or one thousand feet long, just below the crest of the cliff, with architectural terminals and supports. One million dollars could accomplish more here than at any other spot to which materials must be transported and when there hoisted into place, thus consuming no inconsiderable portion of the fund in ineffective freight charges and wages. We trust that it is not yet too late for some competitor to give expression to these crude suggestions.

THE State Architectural Association of Iowa, as we learn from the Des Moines *Register*, held its semi-annual meeting at Colfax a few days ago. The attendance was large, and the proceedings seem to have been very interesting. Among the topics discussed were the Stockslager bill, relating to the design and supervision of Government buildings, in which certain modifications were decided to be advisable; the best form of building contracts; the advantages of association to the professions; rules of practice and rates of compensation; the relation of architect and client; and the State building laws. The Association voted to recommend certain changes in the latter; and showed its wise zeal for technical education by ordering memorials to be presented to Congress in favor of the public encouragement of architectural students, by methods similar to those employed abroad; and to the State Government of Iowa, praying for the establishment of a chair of architecture at the State University. Mr. Illsley of St. Louis, President of the Western Association of Architects, took part in the deliberations, which seem to have afforded an admirable demonstration of the value of State organizations as a most efficient means for advancing the interests of the profession. To refer to a single point only, the recommendations of the meeting which are most likely to be acted upon, and will, if followed, as is very likely to be the case, perhaps result in more good than any others, are those addressed to the State Government on the subjects of architectural education and the building laws; yet such recommendations would be quite out of the province either of local societies or of such comprehensive bodies as the Western Association or the American Institute, and if made by any of these would certainly be disregarded or resented by the State Legislature. There is so much work to be done in the way of correcting and reforming the current habits of building that architects, particularly in their capacity of members of associations, who will have that work to do, should keep constantly in mind the fact that nearly all the conditions under which people in this country live are established by State legislation, as distinguished from local regulations or the enactments of the Federal Congress; and that if they wish to effect any improvement in those conditions they can in most cases do so only by application to the State Government. To secure attention to such applications it is usually necessary to show that the people of the State, not of a particular town or

city, desire the legislation asked for; and if this can be shown there is no further difficulty. By their very constitution the State associations are assumed to represent the technical interests of all the people of the State: there is no danger, as there might be in acting on the recommendation of local societies, that enactments desired in one town might be furiously resisted in another; and whatever they advise seems, to the average legislature, not only worthy of attention, as proceeding from a body whose jurisdiction extends to the same territorial limits as its own, but particularly suited for speedy embodiment in a statute, on account of the probability that no one will appear to oppose it.

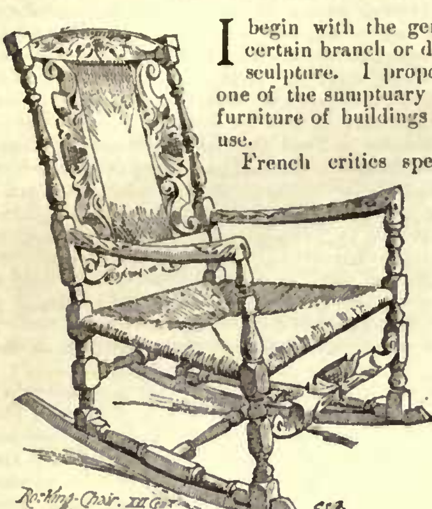
ONE of those singular miscarriages of generosity which occur rather too frequently in this country to cast much credit on our discrimination is described in the recent New York papers. It seems that a certain Mr. Van Schaick, a rich citizen of the town of Westchester, died there five years ago, leaving by will a bequest of fifteen thousand dollars, to be expended in the erection of a free reading-room, as a gift to the town. The executors built a handsome reading-room, at an expense of ten thousand dollars, which was completed in 1882, and prepared to turn it over to the town authorities, with the remaining five thousand dollars of the bequest as a fund for stocking the building with books and furniture. The authorities, however, refused to have anything to do with the structure, and it has remained since its completion in the hands of the executors. Not long ago, the rest of the estate being settled, the executors found it necessary to have the reading-room definitely disposed of, and insisted that the town should take some action in regard to it. A town-meeting was called, and it was explained to the citizens that it would cost about twelve hundred dollars a year to pay the necessary expense of maintaining the reading room, whereupon they voted unanimously to reject the building and the money, which still remain in the executors' possession. We suppose that there must have been some condition in the deed of gift, requiring the town to maintain the reading-room in a certain way, but there are so many modes of evading the intentions of persons who are no longer capable of seeing whether their wishes are carried out that we are rather surprised at the rejection by the Westchester people of a building which could probably have been converted later with impunity into an engine-house or stable. When a few more of these examples have accumulated, it will be worth while, we think, for some one to write a book on the abortive charities of this country. Something of the kind has been done for England, or rather for London, where many curious stories have been collected; and the American instances would furnish a good deal of interesting matter. To say nothing of the Touro charities at Newport, founded for the benefit of the needy Jews of a town which no Hebrew has inhabited for many years, there are in another New England town two churches, both built by private munificence, and dedicated to the Christian religion upon conditions which no one is willing to fulfil, so that they stand from year to year empty. The condition imposed upon one of these is, if we remember rightly, that a certain service-book, composed by the builder of the church, shall be used in it, but this single stipulation is sufficient to keep everybody out of the church precincts.

A CASE came up in England the other day, upon which the intellects of the judges seem to have been greatly exercised. It appears from the *Builder* that a certain gentleman who owned estates in Cumberland had kept parts of them as forest, many of the trees being larches. A year ago the district was visited by severe storms, and twenty thousand larch trees, valued at about as many dollars, were blown down. The owner of the estate was taken sick about the same time, and died before giving any directions as to the disposal of the prostrate trees. In England, as with us, real estate, after the death of its owner, is divided among his heirs in a different way from the personal estate, and the executors, as trustees for those heirs who inherited the personal estate, took it into their heads that the broken larch-trees lying on the ground were personal property, and laid claim to them for their principals; arguing that although trees growing naturally undoubtedly belonged to the real estate, trees lying broken on the ground were no longer real trees, but something else, and as miscellaneous or nondescript articles scattered about the premises would be personal property, these broken trunks ought to be regarded as coming under the same category.

THE heirs of the real estate, in contesting this claim, took the ground that trees should be regarded in the same light as buildings in their relations to the land on which they stood. It is a well-defined rule in England that buildings attached in any way to the earth form a part of the real estate, and cannot be removed by a tenant, even though he may have built them at his own expense, so that tenants who wish to erect conservatories or other structures which they can enjoy during the term of their lease, and carry away with them when it expires, are obliged to make them completely portable. According to this principle the larch-trees, which, although overturned and uprooted, were connected by a few fibres with the earth, still constituted a portion of the real estate of their deceased relative, actual separation of the trunks from the roots being necessary to convert them into personal property. This singular dispute was tried twice before the highest court in England. On the first trial the justice held, with the executors, that broken trees were no longer trees, but something else, and ordered judgment for the plaintiffs; but an appeal was taken to the full bench, and the Lord Chancellor himself pronounced the decree which reversed the former decision, and awarded the property to the owners of the real estate, saying that if any trees had been severed, even though some of their broken fibres were covered with earth, they would belong to the executors, but so long as a tree remained attached to the ground by ever so slender a fibre it was real estate, and went with the land to which it was attached.

THE *British Architect* has lately contained an excellent little series of articles on Hospital Planning, in which we find some points which are new to us, and will be, we imagine, to many of our readers. All architects understand the main principles of hospital construction, and know that isolation of patients, and ventilation and sunshine in the wards, are the requirements to be satisfied before all others, but every one may not be aware of the thoroughness with which these requirements are now fulfilled in the best work. According to the writer in the *British Architect*, twenty-five patients to the acre of ground is considered a reasonable allowance in the most modern Continental hospitals, and the wards are so spaced over the site devoted to the hospital as to secure about this proportion. Unless the area is very limited, all hospital wards of the best class are now built in one story, but in case of absolute necessity the medical wards are made two stories high or more, surgical and infectious wards remaining in all cases of one story only. The wards are also, in the most modern examples, completely detached from each other and from the administration buildings, even the open corridors which were once thought necessary being suppressed. This, of course, occasions a certain amount of inconvenience in bringing supplies from the kitchens and administration block to the wards, but the cooked articles from the kitchens are kept warm during transportation by being placed in covered iron trucks with hot-water jackets, and the annoyance to the physicians and attendants incident to going out of doors whenever they pass from one building to another is considered to be more than compensated by the greater security of the patients from infectious or communicable diseases. The principle of isolating the wards from the ground, by raising them upon a low basement open to the air, is now universally adopted, the height of the basement being usually restricted to three or four feet, so that there may be no temptation to use it for storage, to the detriment of the healthfulness of the ward over it. Within a short time an innovation, undoubtedly suggested by the experience of military surgeons, has been introduced in the best civil hospitals, and will probably become an important feature in the planning of future buildings of the kind. This novelty is the addition of large open balconies, closed only at the ends, to the wards, into which the beds of the patients are moved during the summer months, remaining there night and day except in stormy weather. At Halle and Dresden, neither of which have a particularly mild climate, this arrangement has been adopted with great success, and the Bethanien Hospital at Berlin has been altered to conform to the new idea.

CARVING AND FURNITURE.[1]



Rocking-Chair. from St. Augustine: Fla: from Collection of old Furniture of the late Mr. Emerson: G: Shaw: No. Beverly: Mass: E.E.B.

I begin with the general consideration of a certain branch or development of the art of sculpture. I propose to treat it mainly as one of the sumptuary arts, concerned with the furniture of buildings and houses of everyday use.

French critics speak of wood-carving as sculpture in wood—correctly as regards the word. It is sculpture if we produce a figure, a flower, or a leaf out of solid wood or any other material. But the processes of what we call sculpture are different from those of carving with mallet and chisel, with which we are now concerned. I shall apply the word sculpture only to wood-work in very hard materials, in which the surfaces have to be bored and scraped, and where the character of the design is suited rather to the gallery or the shelves of a collector, than to the decoration of walls or furniture.

Now when any one not a wood-carver or furniture maker by profession ventures to assume the master's chair, a serious question is forced on his attention — at least on mine — and it is this: How comes it that any one should be lecturing on one of the arts connected with daily life, except a professor or a master to his own class? And it must be answered that wood-carving, as a sort of necessary accompaniment to the architecture of the day, seems to have fallen into desuetude. Sumptuous and well-made furniture is produced in London and other large cities; but carved cornices, carved panel-mouldings, carved fireplaces, doorways and so on are so very rare that we have to rouse attention to the carvers' art as if it were a revival. Nevertheless, the value in which carved work is held may be measured by the prices at which the fragments of Old London are being bought up, and the place which many of these fragments occupy in our national museums.

This disuse of carving in modern houses being our excuse, I hope we do not waste time in devoting an occasional evening to a subject in which I am myself so deeply interested.

Before going further, let us dismiss with a word or two what has been called sculpture in wood. Box is the wood most commonly used in wood-sculpture; it is of slow growth, hard, close-grained, with narrower alternations of hard and soft in consequence, and less liability to shrink or split than is the case with oak or pine. It will retain sharp-edged lines of relief, incredibly fine, as we see in some modern wood-carving. It is in use for figure sculpture and other subjects requiring knowledge and skill of the highest kind. There is, however, a good deal of bold carving in box and pear, cut out in bold curves and sweeps, as if the wood were no harder than pine. The Kensington collections contain curious examples, the work of Italians of the sixteenth century. I should call all such work carving rather than sculpture, because of the character of the work.

2. I think it may be maintained, looking at Old London, that wood in our climate is the due complement of stone and brick. It is the inside lining of which the hard material is the outer coat. Wood panels are not freezing to the touch. They make interiors warm and comfortable, as well as rich and dignified. From the ease with which the materials can be cut, we get effectual decoration in actual relief of light and shade; and, once done, it is found to be as durable as the walls of the house, and in no danger of those dismal chips and peelings to which the plasterer's work is so subject.

I was struck with the contrast between the present system and the older one, by what I saw in a beautiful country house not long since. The house itself is old, the exterior finely carved in stone. The interior has been refitted and arranged at a great cost. The woodwork of shutters, and dados in two woods, is admirably fitted. All that the steam plane and modelling irons can do is finished to perfection. On the other hand, when I looked for carvings, I found lines of moulding, key-frets, and so forth, not carved in wood, but in lengths of stamped putty or other compositions glued on. In no long time I observed much of this applied composition curling up and coming off. The builder had to renew it. It struck me with astonishment that where so many thousand pounds were spent on joiner's work, one or two hundreds could not have been devoted to carving.

I do not know what convulsions of society or phase of manners has made so important a change, and eliminated from our houses decoration so necessary for their completion. It may be that the wars with which this century opened were a turning-point in history with regard to the plastic arts. Perhaps when large London estates were rapidly covered with houses, that scourge of London arose, the modern speculative builder. Calculating on a rapid fortune, he invented one house. That one house has been repeated *ad infinitum* —a forlorn design it is, and the example so profitable to the builder has covered modern London with the dreariest streets to be seen anywhere in Europe.

It seems useless to discharge these thunders when the work is done, and so it would be were better prospects hopeless; but, in my opinion, this is far from being the case. The work of Mr. Norman Shaw and some other architects gives me some solid grounds of hope. They have grappled with a difficulty obvious to reflecting minds. All men are not agreed in their likes and dislikes, occupations or habits of life. Why should they all be compelled to live in houses of one and the same type and shape? The gentlemen I have named have tried to fit the house to the man or family that are to live in it, not to force the inhabitants into houses that do not suit them. I do not profess to admire all I see in Queen Anne houses. I do not care for mere eccentricities, nor for details designed merely as quaintnesses, and put where they are without any corresponding convenience or advantage. But in general I think the inventors of our present red brick houses have done an essential service to London.

I refer to architecture because it is absolutely necessary to do so. Furniture, whatever we include in the term, is intimately connected with the house it furnishes. To treat of walls is to consider how the architect has built them, and how they ought to look inside when his house was finished. I do not reckon the house in the modern street —in Cubittopolis for instance, or the streets abutting on the New Road — I do not reckon them as worthy the name of architecture. They are bricklayers' and carpenters' work, and nothing more. No mind whatever has left its stamp upon them. If carving finds its way into such houses it has been purchased by the occupier, who wants to make the one he lives in as unlike its neighbors as possible.

Not so in the case of Old London; the narrow streets and lanes that were built after the fire contained houses of which many noble examples yet linger in the city. Consider, on the other hand, the vast and imposing public buildings that have risen between Palace-Yard and Cromwell Road. It is worth while to ask what part such beautiful and effective decoration as wood-carving plays in the interior of those buildings, if we except the Parliament Houses of Barry and Pugin? So far, then, as to the connection that there ought to be between architecture and carved wood; architecture in general, and that revived brick architecture in particular, of which I have had occasion to speak.

3. Now let us consider more particularly what the opportunities of the carver are, and what different methods of treatment he has at his command. I say *he*, but I ought to add *or she*, for we have many excellent lady carvers. What are the carvers' opportunities? There are the beams of which parts of all houses are constructed, and which, being of wood, are to be carved, *when the style of the architecture exposes them to view*, as in church and hall roofs, rooms in which the joints of the floor above are exposed, etc. As beams and timbers are concentrations of strength, they often have to bear walls that exceed their thickness, and project beyond their edges, such as door lintels, architraves, and the like. In these cases it is the angular edge, or so much of the edge as will not impair the strength of joists, or rafters, that can be carved effectively. In the case of a post, such as a stair newell, the king-post of a Gothic roof, both edges and sides can be carved, extra length of wood being allowed for the purpose above the stair newells, or below the king-posts, without interfering with the actual purpose of these posts, either in reality or apparently, apparent strength being necessary to due effectiveness.

As to running mouldings worked on edges, whether of beams, joists, rafters, or rails of any kind; or again, on the angles of door and window jambs and lintels, or on the framework of panels, the distinct rolls and hollows of which they consist must be limited in number. There should never be less than three, that a due proportion between the members may be maintained, nor should they be too numerous. Brackets have so many distinct ends projecting over the other. Cornices are made up of rows of brackets, or are one continuous running bracket. In this way cornices represent thickness of wood projecting from the wall one above another, and should represent, say, an upper, a middle and a lower projection. We ought to preserve this idea in complicated cornices, and give emphasis to the middle feature; then there will be a group of lines above it and a group of lines below. These groups break the angle between roof and wall, or anything that represents roof, such as the top of a chimneypiece, of a doorway, and so forth. When you see an unmeaning succession of repeated mouldings, as you often do in builder's decoration, you will feel that the real idea of their relation to each other has never been grasped.

4. *Wall Surfaces.*—If from solid timbers we pass to wall-surfaces, it is obvious that large wall-spaces can only be covered by framed panelling. The framework must be of sufficient thickness to be grooved to take the panels, and this extra thickness has to be relieved from the heavy appearance of a mere thick edge. We have to ease down the edge by mouldings or lines in relief, some bolder, others finer, as the edges of the frame decrease till they meet the panel.

In a large room cut up into panelling, the general effect will depend on the size and proportions of the panels, to height and width of the room, and of the rows of panels to each other. Panelling requires to have some rows taller than others, and to have upper and lower rows of less height than the general order. Upon the size of the panels will depend the boldness and size of the mouldings. We meet with

[1] A lecture by J. Hungerford Pollen, delivered before the Society of Arts, and printed in the *Journal* of the Society.

large panelling in which the mouldings are planted into the junction of frame and panel, and exceed the thickness of both. I do not think it a good feature, and it is often a vulgarism. In carving mouldings there are two rules to observe — one, that the general form and outline of the original lines, or bars, or hollows moulded by the plane have to be preserved; another rule is that no work put upon these features ought to be allowed to quarrel with the direction of their lines. Foliage or plaited ornaments should run at right angles with that direction, and be delicate enough to lose themselves at a distance, at which the original moulding only can be distinguished. But in all large surfaces of panelling the greater quantity of moulding will be worked mechanically by a plane-iron filed to the curvature required. If you examine the small panelling of the fifteenth century, much of it will be found to have been executed by a tool worked by the fingers, *after the wood has been framed together.* The mouldings die down without meeting in the angles, but these mouldings are necessarily small and shallow. On furniture, chests, and other more important joinery, mouldings seem to have been cut throughout with the carver's gouge.

Here, then, we have the treatment of edges of panels. How effective they can be made I need not say. Panels are sometimes made of wood, so thick as to be brought up to the level of the rails that frame them, and reduced by wide bevellings to meet the grooves of stiles and rails. The thick parts are left with a defined edge, as though a thin extra plank were added to the thickness. I consider that the proper purpose of this thickness is to allow of carving. Carving in these parts has to be in very low relief — historical subjects or leaf-work compositions. Figure-carving in such places is sometimes of extraordinary merit. Examples can be seen among the cabinets of the Soulages collection in the Kensington Museum.

There are, of course, parts or features of all interiors in which the carver has to put forth all his powers, those in which bold relief can be employed — door-heads, fire-places, and other prominent features. Here will come figure-work, bold foliage, heraldry, and the like.

5. *Piercing and Turning.* — A different class of carved work consists in pierced carving; screens, fittings, of openings of various kinds in which light has to be seen through, and not thrown on to wood-work. And again, another in the work of the turning-lathe. No combined wood-work, on a large scale, can be carried on without the help of the lathe. We have but to look at old houses in our own country, and, indeed, may refer to the paintings and sculptures of antiquity in which furniture is represented, to see how large a part was played in its construction by the lathe.

In the sixteenth century, German turners showed astonishing ingenuity in the eccentric motions contrived in the turning-lathe. But here I am only thinking of the commonest operations of that engine, and we can hardly appreciate how effective its action can be made. I will show, in a later lecture, some examples of Arab turned work.

In these various operations there is room for infinite variety of treatment, and judgment as to the best way of disposing one's powers with due economy of labor and cost. Employers have certainly to be encouraged to employ the carver; but to make his work effective it is indispensable that he should be able to show it in all varieties, whether abundant in quantity or not.

6. Generally and broadly speaking, what is it that makes carving effective? Not extreme skill in cutting, nor absolute imitations of nature, however good. It is a knowledge of, or rather, an habitual recognition of, laws that govern all composed design, which becomes what we know by the word *feeling.* We have spoken of mouldings on the edges of wood-work, and of compositions of foliage and figures, heraldry, and other ornamental composition. What is the law that governs the due prominence and arrangement of lines and masses? I consider mouldings as bars or borders of light, separated just so much from the surface to which they form an edge as to show their outline. This first edging is the largest and widest, as it is on the thick portion of the wood; on its shaded side it dies gradually till it ends in a smaller roll, and then, perhaps, a sharp arris. Here is a group of lines carefully adapted to each other. If we draw a doorway or an opening, an agreeable effect is produced by the mere use of a few lines of pencilling to indicate the gradual introduction from the light to the shadow. Mouldings produce a similar effect in wood-work. Mouldings may vary indefinitely in the proportions of the light and shadow that run along them, and the way these elements are contrasted. If you watch the growth and decay of styles of architecture, it is in the multiplication, or breaking up, or loss of meaning of mouldings that these stages of decay and corruption are most obvious. Mouldings form three-fourths of the carver's work.

7. *Compositions in Full or very High Relief.*—Carry this principle farther into the composition of carved groups, such as fill sunk panels or pediments. One may be able to carve the figure of a man, a lion, or a piece of foliage, but so to combine a number of such figures as to make each of them evident, to give the grace or the force that belongs to each of them respectively, and when combined to form an agreeable and well balanced composition of masses and line of light, here is the difficulty.

A picture is a little passage of history real or supposed, a piece of dramatic action — or it is a view of nature. Composition, a graceful arrangement of line, is of importance in either case. But to put together things that differ in nature and structure from each other, a man, an animal, a scroll of foliage, in the way required for the decoration of a pilaster, a pediment or a piece of wall, we have no such guide as the painter has for his picture. There is no story to tell, no connection as in the elements of a landscape. They must be brought up to the light, be combined or separated, or be partly concealed by scrolls or leaves in such ways as will look well even before the carver has entirely satisfied us what he intends his prominent masses to be, while still unfinished. The greater the dignity of the group, as, for instance, one composed of men only, as in a Greek pediment, the more distinct must be their shapes, and the fewer decorative additions near them. The Greeks colored their pediment compositions to make them more distinct than they could have been in mere white marble. As in mouldings there are larger and smaller lines, so in carvings in the round or in high relief, we have to compose the decoration in such ways as not only to give prominence to the most important portions, but generally to balance one side of it with its opposite, to have also a subordination of small to larger masses. Sometimes a balance is maintained by a repetition of detail on opposite sides of a central stem or figure. Sometimes in a more subtile manner, not by a repetition, but by an equivalent, in different parts, perhaps, of the space to be filled.

8. *Relief.*—Regarding the amount of detachment or absolute relief that good carving in such cases ought to have, it will depend on the character of lightness and of movement the carver wishes to give his work. Generally, carving of this kind should never lose touch in appearance from the mass to which it belongs, and should die gradually into the shadow. Much excellent carved work loses value from too much under-cutting, even in the work of so great an artist as Grinling Gibbons. Further, if carving is not to appear as if it floated in a disproportioned sea of shadow, neither should it be so crowded up as to become indistinct. I have seen sideboards in some of our great exhibitions in which much careful and laborious work was spoiled by ill-arranged crowding of figures and other details. Nor can decorative carving be carried, except to a limited degree, to the direct imitation of nature. As nature would not join animal and vegetable life together, so we are to represent natural life and living objects not as if we were making definite pictures of them, but such features of their nature as will gracefully express the arrangements of light and lines as are required for our immediate purpose, and no further.

The value of light and its concentration on masses of relief is of the first consequence to the carver, grace of line is second. Not that the two are separable, but the composition of masses seems to me the more difficult of the two.

9. I have alluded to pierced work; it is either made in scrolls of foliage or plaiting, such as we see in the furniture of the last century. Tables, chairs, rows of corner shelves, and so on. The legs and backs of chairs and tables are pierced, and the edges of tables and shelves, surrounded by tiny galleries of pierced mahogany. These objects require no great amount of knowledge to design, and scarcely deserve to be called carving, but they are not devoid of a certain elegance and agreeableness; generally, the material and workmanship are admirable. Oriental wood-carving presents us with frequent screens and large even spaces broken only by piercings, and the piercings less in extent than the solid portions. They are, if rightly placed, full of value in general arrangements of wood-work; broad even spaces expressive of repose, having the character of minute workmanship and richness, though mere repetitions of some simple pattern.

Here I leave off this short review of what seem to me the more important divisions of the carver's field of work. I say little as to what he may attain to as a sculptor, or a carver of images, statuettes, and other fine examples of his skill. I want to confine your attention to subordinate and decorative work. A carver's first duty, no doubt, is to carve, to have a light and subtile hand, and a perfect command of the gouge and chisel. But the most dexterous of carvers runs the risk of faults which may spoil his efforts. He may be uncertain of his aim, not knowing clearly what he wants. He may be weak, wiry and dry, or ostentatious and redundant; feeble, in short, or vulgar, or both. He ought to know what he wants, why he wants it, what the style of his walls requires for its due completion in each instance. If the work proposed is new to him, he has to master the spirit of it to the best of his abilities. He has to decide how to keep his carving light without loss of strength; full and sufficient, without crowding and redundancy; orderly and balanced with a judicious distribution of the work he can afford to bestow on his wall, or room, or house, or cabinet, or whatever he takes in hand; to secure unity of design throughout the whole, whatever variety of detail he may employ in different parts.

The Ravenna Mosaics. — The mosaics in most of the churches at Ravenna are undergoing renovation: in fact St. Apollinare Nuova and the Baptistery are the only ones in which a scaffolding is not erected for the purpose. And the latter of these two is threatened. The mosaics in it are not in a good condition, and appear to have been picked off as relics by visitors at their will. There is, and has been for some time (judging from the fact that it is reported in most guide-books) an idea of raising the whole building by machinery. At present it is what might be called an open sepulchre, only surpassed by the catacombs of St. Sebastian at Rome. Ravenna should not be visited by English travellers during the hot weather, as in most of the churches, in which places all of the interest is centered, notably St. Vitale and St. Apollinare in Classe, there is stagnant water, which has a horribly putrid smell, within eighteen inches of the surface. The drinking water, which is much the same, is also very bad, and if taken, even with wine, produces uncomfortable results. — *The Builder.*

THE CAUSE AND PREVENTION OF DECAY IN BUILDING-STONES.[1]



THE origin of the investigations as to the cause of the decay of building-stones was the observation by the corporation of the Trinity Church, New York City, of signs of decay in the stone of some of the structures under its charge. The investigation was intrusted by that corporation to Professor Egleston, and authority has been given to publish the results. The building-stones mostly used in the United States may be classified as granites, sandstones and limestones. The decomposition of the granites is slow, and has been carefully studied. An example is the Egyptian obelisk, now in Central Park, New York, which has stood for two thousand years in a dry climate. A crumbling decomposition had occurred to some extent before it was brought to America. Since its arrival in New York the disintegration has been very rapid. Pieces can be picked up after every storm. If it be not in some way placed under cover, the injury will in fifteen or sixteen years be probably beyond repair.

It is usually supposed that the sandstones that are used for buildings are homogeneous and composed of very few substances. The examination of the stone of Trinity Church, however, shows that it contains twenty-six different minerals, none of which were recognizable without the aid of a microscope. The sandstones may be divided according to their binding material, as those containing an organic, a ferruginous, a calcareous, or a silicious binding material. Those containing the organic material decompose and go rapidly to sand. Those containing the ferruginous binding material are very uncertain, the amount of iron frequently being just sufficient to hold the sand together, and sometimes after a slight exposure the material decomposes entirely. Those containing a calcareous binding material are affected by the weather, and after a certain time in large cities this calcareous cement is entirely removed and the stone goes to pieces. The silicious binding material is not affected.

As an instance of the way in which these stones decompose: the Cathedral at Rodez, in the department of Aveyron, France, was commenced in the eighth century; the lower part of the building was finished three or four centuries later, but the upper part was finished towards the close of the last century. All the mouldings of the lower part are as sharp to-day as the day they were cut, while the upper part is a ruin. The stones of the lower part were selected while building was done by a religious fraternity with great care. The upper part was done with less care, and stones liable to decomposition were used.

The limestones may be divided into those which are essentially composed of carbonate of lime; the dolomites, which are carbonate of lime and magnesia; and a mixture of the two. Limestones themselves, or dolomites themselves are not very easily affected; but when there is a mixture of the two, the limestone is very apt to be dissolved out, leaving the dolomite behind. If, as in the case of the quarries in Lee, Berkshire County, Mass., the two are about equally divided, the limestone is frequently dissolved out, leaving the small dolomite crystals as sand.

The investigations made of the stones used by Trinity Church, on the building itself, showed that the decomposition is at a maximum at or near the foundations, and continues as such to the height of about ten feet or fifteen feet, but it shows itself mostly at or about the water-table; that it then gradually diminishes, until, at about sixty feet or seventy feet the action is very much diminished, and above one hundred feet no decomposition whatever has taken place, and the stone is harder than it originally was. The explanation of this decomposition is at first sight not very clear, but it is noticed that wherever there are projecting surfaces which are flat, on which the water will stand and through which it will sometimes pass the decomposition is always prominent. Wherever these projecting pieces are not undercut, so that the water will run back upon the under surface, or wherever they do not project sufficiently to prevent their pouring or dropping upon the stones below, there the decomposition is the greatest. Wherever the stone is thin, so that the water will filter through it, the stone has crumbled entirely. This action is owing to the fact that city gases contain a very much larger amount of acids, notably carbonic and some sulphuric acid, than ordinary country air, which are dissolved in the water and attack the stone. As these gases are more confined in cities than they are in the country, the lower part of buildings is most attacked; but where they have the opportunity (as higher up) to be diluted in an excess of air, there the action is only very slight. Carbonate of lime is very soluble in water containing carbonic acid in solution, and as this is by far the largest ingredient of the impurities of city gases, in the long run it will dissolve out the cement. The way to prevent it is to in some way waterproof the stones, so as to prevent the action of the air. This should be done at the foundations, by preventing the creeping of the water from the ground through the stone by putting a layer of asphalt above the foundation stones, and then by protecting the stone itself by some means.

The experience in the Houses of Parliament in England has been that, unless the stone is protected upon all its sides, most of the materials which have been used are of little or no use. A careful examination showed that the decomposition went on upon the outside, and that the flaking continued with every application made, except in the single case where sulphur in solution was applied to the stone, and this, after a lapse of over twenty years, has just commenced to flake.

In the case of the limestones, a noticeable decomposition is that of a marble tombstone beside the Lawrence Monument, on the south side of Trinity church-yard, the upper slab of which was originally highly polished. The carbonate of lime has been dissolved out so as to leave the upper face entirely rough, dolomite crystals being quite prominent, so that no one would suspect that the stone had been polished. Those stones which include minerals liable to decomposition in the air, of course, furnish the disintegrating material for the attack upon the stone.

There is another cause of decay to which little attention is paid, and that is the abrasion of stones from the outside, caused by the action of the wind carrying the dust against them. The destruction caused by this effect is much greater than it would at first sight appear, and, in order to ascertain how far it might act, I made a number of experiments, hurling a sand blast against stones of different textures at a high velocity. The result was that no stone would stand for any length of time against the blast, and even an appreciable weight of diamond was worn away by it in less than ten minutes. The examination of the city dust shows it to be made up of a large number of materials, including sharp quartz sand, a considerable amount of iron, and other materials which are softer, but which have a very considerable abrasive power. In many of the church-yards this abrasive power can be seen where the inscriptions on the stones are placed in the direction of the prevailing wind, in which case many of them are worn very nearly smooth from this cause alone, there being no other cause for deterioration.

Slate is a material which is rarely used for buildings, but which answers for certain purposes very well when placed on its quarry bed. When placed in a vertical position it is very apt to laminate, but it also frequently undergoes a decomposition by which it is reduced almost to a clay. This kind of destruction cannot be prevented, but its maximum effect is confined to a very short distance above ground. Experiments made upon the decomposition of stones since the year 1861 have shown, however, that other varieties of stone may be entirely protected by some kind of waterproofing, which, after a building is constructed, can only be applied to the external surface.

There is no necessity for the decomposition of brown stone if the material is carefully selected. Every building that I have ever examined contains some stones that would last indefinitely, and if from the quarry only those were selected which had a silicious cement, there would be no necessity for waterproofing, and we should not have the rapid destruction in beautiful structures which is so common in countries where sandstones are used. The same kind of external waterproofing must also be done upon dolomite and stone; but efforts in this direction have been less successful than upon sandstones. Many methods for the prevention of disintegration have been tried with little success. To secure the waterproofing of the stone, paraffin would be a good material; but it cannot be made to enter the stone without the use of a greater heat than would be possible without injury to the stone. The best material for the purpose is boiled linseed oil. If stones could be dipped in boiled linseed oil, they would not decay, because water could then attack them from no direction.

[1] By Prof. Thomas Egleston, M. Am. Soc. C. E. Abstract of a paper read before the American Society of Civil Engineers at their annual meeting, June 24, 1885.

THE SARATOGA MONUMENT. — The Saratoga Monument Association has commissioned O'Donovan, Doyle and Bissell as sculptors of the heroic statues of Generals Schuyler, Morgan and Gates, to be placed in the niches of the monument, and J. S. Hartley and James Kelly to do the tablet work for the interior; the designs of the architect, Mr. Markham, in which the historic personages are to be portraits, for these tablets are: first, women of the Revolution; second, ladies of the British court; third, the town meeting; fourth, the rally; fifth, George III in council; sixth, Burgoyne addressing the Indians; seventh, transport of the wives of the English officers in their calashes through the wilderness; eighth, Schuyler felling trees to obstruct the enemy; ninth, Mrs. Schuyler firing her wheat fields; tenth, the murder of Jane McCrea; eleventh, Burgoyne reprimanding the Indians for their barbarities; twelfth, Schuyler turning over the command to Gates, surrounded by a group of American generals (all likenesses); thirteenth, the passage in a boat of Lady Acland under a flag of truce to the American camp to visit her husband; fourteenth, the wounding of Arnold at the Brunswick redoubt; fifteenth, the burial of General Frazer; sixteenth, Burgoyne surrendering his sword to Gates.—*Exchange.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

HOUSE OF MR. CHARLES E. HASBROOK, KANSAS CITY, MO. MR. A. VAN BRUNT, ARCHITECT, KANSAS CITY, MO.

This house is finished in hard-wood; first story brick, second story frame, and presents in a modified form the modern features of the Colonial style of architecture. It has thirteen rooms, exclusive of pantries, bath-room and closets.

HOUSE OF S. E. GUILD, ESQ., NAHANT, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

COMPETITIVE DESIGN FOR THE MUSIC HALL, BUFFALO, N. Y., SUBMITTED BY MR. H. T. SCHLADERMUNDT, BUFFALO, N. Y.

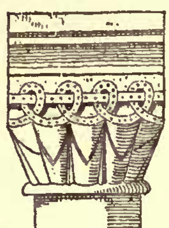
VIEW ON THE CANAL AT REAR OF THE HÔTEL DE VILLE, BRUGES, BELGIUM.

PALAZZO DEL COMUNE, PIACENZA, ITALY.

This building was built in the thirteenth century.

TALL CHIMNEY CONSTRUCTION.[1] — IV.

THE GEORGS-MARIEN IRON-WORKS, NEAR OSNABRICK.



From Abbaye aux Dames, France.

The first chimney, erected in 1857, has a height of 180 feet.

	ft.	in.
Clear width at the bottom . . .	10	0
" " top	7	0
Height of square basement built in sandstone	30	0

Octagonal shaft of bricks; the walls of which are made of six different thicknesses, consisting of one and one-half bricks at the top, and of four bricks at the bottom. (The lengths of the bricks used at Georgs-Marienhutte is ten inches).

Two other chimneys, one hundred and two feet high, have also a square basement of sandstone, and an octagonal shaft of bricks, with a clear width of four feet at the top, and of six feet three inches at the bottom; the walls of these shafts are each twenty inches thick at the top, and thirty inches thick at the bottom.

A fourth chimney erected in 1868 has a height of one hundred and two feet, a clear width of seven feet at the top, and nine feet at the bottom; the shaft is built in four thicknesses of one, one and one-half, two, two and one-half bricks, whilst the base, eighteen feet in height, and made of sandstone, is three feet six inches thick. The shaft of this chimney is built from the base to the top in such a manner that it forms in the circumference four separate parts, which are simply brought in contact with each other without being jointed by mortar.

This construction has been found to answer exceedingly well, and is recommended for chimneys exposed to various temperatures, as, for example, in the case of chimneys connected with coke-ovens; the gases of which are either applied to the firing of boilers, or are allowed to escape directly into the chimney, in the event of the boilers being laid off for cleaning or repairs. The latter arrangements have, however, been altered so far that, with the hot gases, cold air is simultaneously admitted into the chimney.

The most recently erected chimney, built in 1870, is sufficient for twenty of the Cornish boilers, and has a height of one hundred and twenty feet, and a circular shaft of a clear diameter of ten feet at the top, and ten feet ten inches at the bottom. This chimney has no base, and the thickness of the walls decreases in seven steps from four bricks to one brick (ten in each). The circular form has been chosen in order to save the expensive base, and the many-shaped bricks necessary for octagonal chimneys. All the chimneys have been erected without scaffolds, and by conveying the materials through the inner space of the chimney; and neither at the erection, nor during their use has any fault been found.

GROSVENOR-ROAD, PIMLICO, PUMPING-STATION (WESTERN DISTRICT MAIN-DRAINAGE WORKS).

This chimney-shaft of gault bricks and Portland stone dressings, is two hundred feet high, and has quite a campanile-like appearance, with its recessed and arcaded sides. It is a model shaft in its style. The foundations of the shaft rest upon a mass of concrete thirty-five feet square, carried down to the clay.

The shaft is constructed double.

The circular central shaft is seven feet diameter, serves for the smoke, while the outer square casing encloses a staircase consisting of two hundred and twenty stone steps, reaching to the top, which is terminated by a heavy iron capping and stone cornice. It will be thus seen there is some æsthetic reason for the Italian tower-like casing. This square tower measures twenty-one feet at the base, and fifteen feet at the summit.

[1] A paper by R. M. Bancroft and F. J. Bancroft, read before the Civil and Mechanical Engineers' Society. Continued from page 57, No. 501.

Sir J. Bazalgette, C. B., engineer-in-chief; Mr. Lovick, resident engineer.

The bricks were purposely-made, and gradually tapered from eighteen inches to fourteen inches.

The lightning conductor is of copper tube.

CHIMNEYS AT DEN'S WORKS, DUNDEE. — No. 1.

This chimney is —

193 feet from bottom of foundation to point at top.
174 " " ground level " " "
9½ sq. ft. inside at base = 90.25 sq. ft. area.
6 " " " " top = 36 " " "
Contracted at outlet to 25 " " "

It carries away the smoke from —

Fifteen boilers sixty-three feet below base of chimneys = two hundred and twenty-five feet from firing level to point at top. The smoke is conveyed from both of these ranges of boilers to the chimney by a long sloping brick flue or tunnel. Cases sometimes occur where it is necessary to have the chimneys some distance from the fires. Mr. Clegg, in his treatise on the "*Manufacture of Coal Gas*," page 177, says: — At Dolphinholme, in Lancashire, where a large worsted mill was lighted with gas, it was necessary to remove the chimney a quarter of a mile; the flue to same being carried along a field arising about one in twenty.

Four boilers eighty-six feet below base of chimney = two hundred and forty-eight feet from firing level to point at top.

Total, nineteen.

The range of four boilers (each having two flues), consume eleven tons each, or about forty-five tons of coal per week of sixty hours work, or fifteen hundred-weight per hour, and the opening at the bridges of these boilers is one hundred and twenty-three inches ∴ four boilers by two flues = 8 x 123 inches = nine hundred and eighty-four square inches at opening.

$$\frac{\text{984 sq. in. at openings.}}{\text{15 cwt. consumed per hour.}} = 65 \text{ sq. in. for 1 cwt. per hour.}$$

Mr. Carmichael records having made ninety observations on the draught at the bottom of the chimney.

The highest recorded 88
" average " 8
" lowest " 55

In taking the observations, the height of the barometer was noted and the direction of the wind. The changes of the barometer do not show (Mr. Carmichael says) much effect on the force of the draught; it seems most affected by wind, being lowest in a south or south-west wind.

No. 2.

This chimney is —

135 ft. from ground level to point at top.
7 " sq. inside at base = 49 sq. ft. area = 7 sq. ft. for each boiler.
4¼ sq. ft. " " top = 18.06 " "
Contracted at outlet to 13.78 " " = 190 " " " " "

It carries away the smoke from seven boilers, the furnaces being about level with base of stack. They consume about seventy-five tons of coal per week of sixty hours' work, or twenty-five hundred-weight per hour from getting up steam on Monday until stopping on Saturday. The opening at the bridges is one hundred and twenty-three square inches ∴ seven boilers by two flues = 14 x 123 = 1,722 square inches at openings.

$$\frac{\text{1,722 sq. in. at openings.}}{\text{25 cwt. consumed per hour.}} = 6859 \text{ in. for 1 cwt. per hour.}$$

When Mr. Carmichael wrote of this chimney, he had made ninety-four observations on its draught.

The highest recorded 875
" average " 75
" lowest " 6

This chimney was built for four boilers, and while so working it collected soot inside to a considerable extent; and occasionally the soot caught fire, and burned out in sparks and showers of smut. When working with the seven, as above stated, it became free from soot, and the surface of the bricks perfectly clean.

No. 3.

This stack being intended to supply only a few boilers, it was made as small and light as possible.

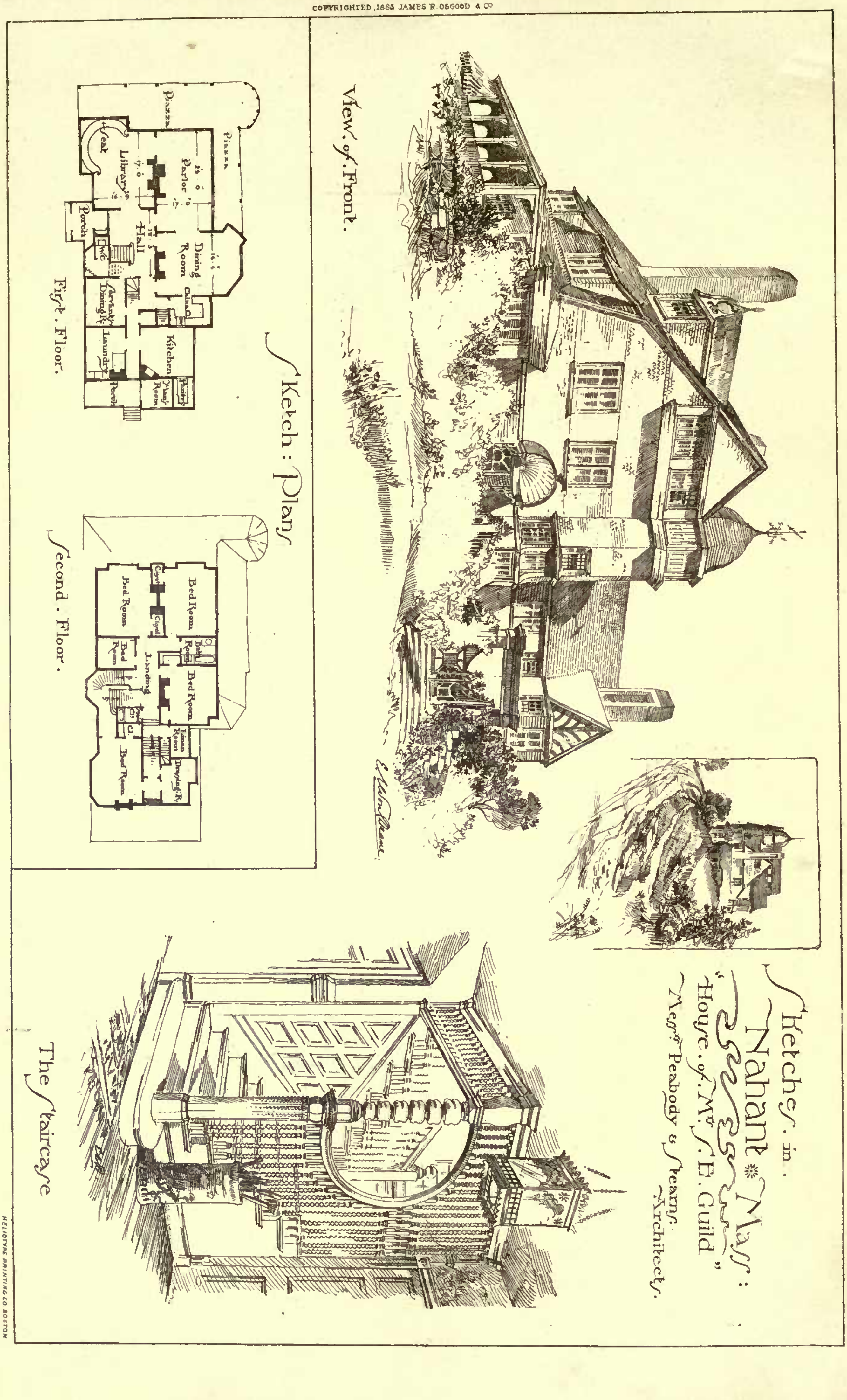
102 ft. 8 in. from ground level to point at top.
4.25 sq. ft. inside at base = 18.06 sq. ft. area.
1.5 " " " top = 2.25 " "
Contracted at outlet to 1.75 " "

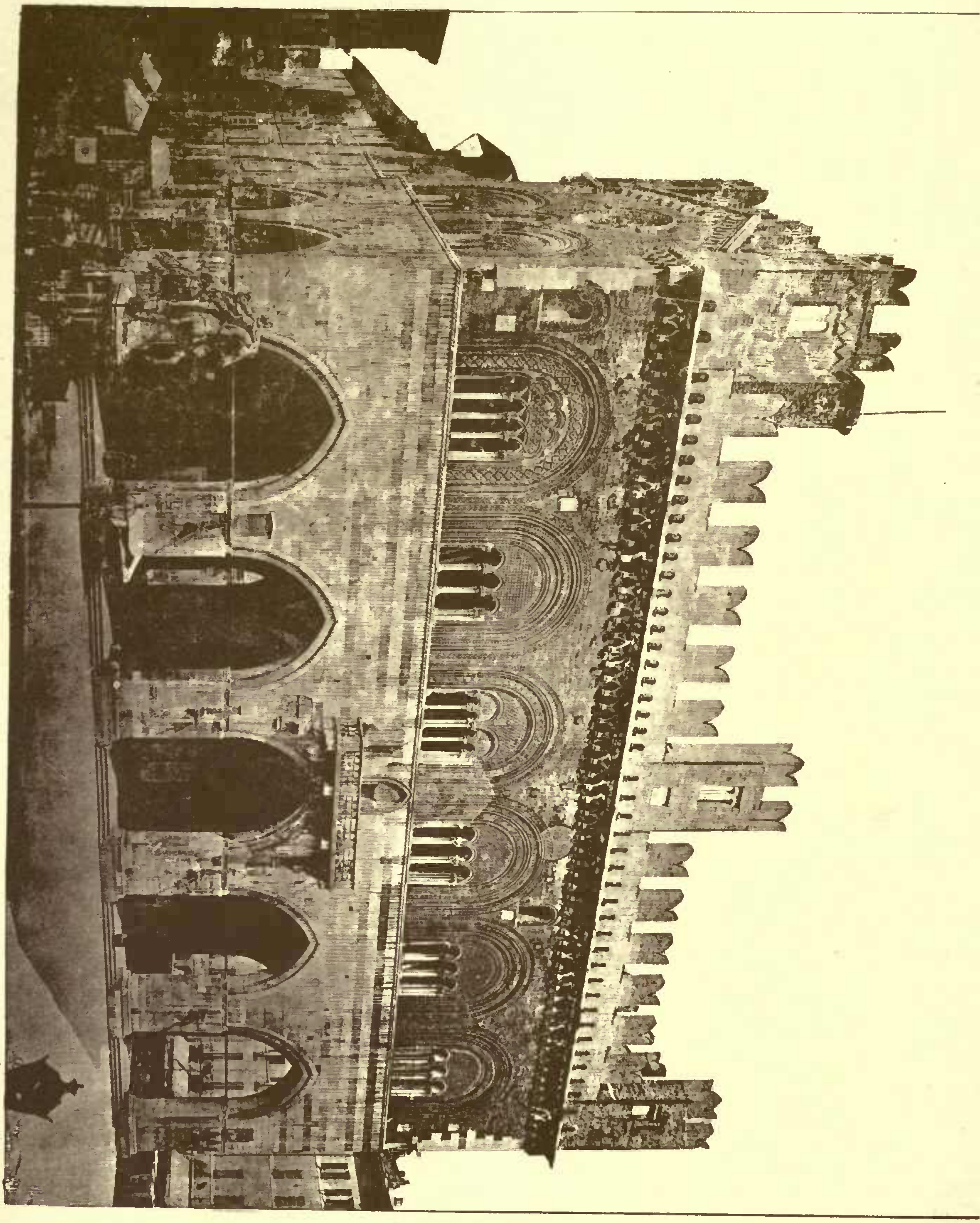
When first built, one boiler only was connected to this chimney — the consumption of coal being about ten tons per week.

Of the thirty-one observations recorded

The highest was 537
" average " 5
" lowest " 45

Some pigeon-holes, sloping acutely upwards, were made in each side at the top, thinking, the wind blowing into these, the current being thus directed, it would assist the rising smoke. The effect


View. of. Front.
Sketch: Plans
First. Floor.
Piazza
Parlor
Library
Seat
Porch
Hall
Dining Room
China Cl.
Servants Dining Rm
Kitchen
Laundry
Pantry
Porch
Second. Floor.
Bed Room
Bed Room
Bath Room
Bed Room
Landing
Bed Room
Linen Room
Dressing Rm
Bed Room
Sketches. in. Nahant Mass:
"House. of. Mr. S. E. Guild"
Messrs Peabody & Stearns
Architects.
The Staircase

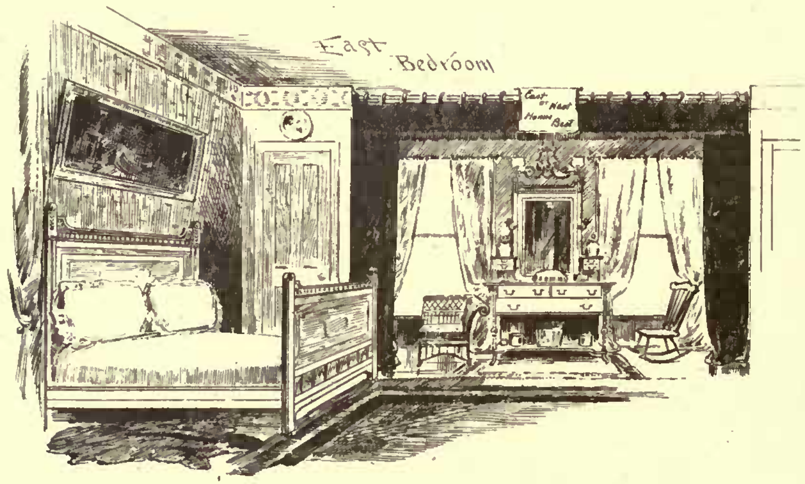


Palazzo del Comune, Piacenza, Italy.

HELIOTYPE PRINTING CO. BOSTON



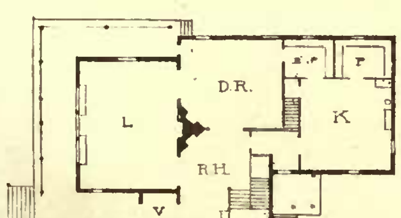
A Corner in the Library



East Bedroom



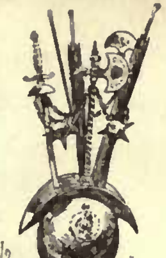
In the Dining Room





Residence of Mr. Chas. E. Hasbrook Kansas City. Mo.

A. Van Brunt. Architect

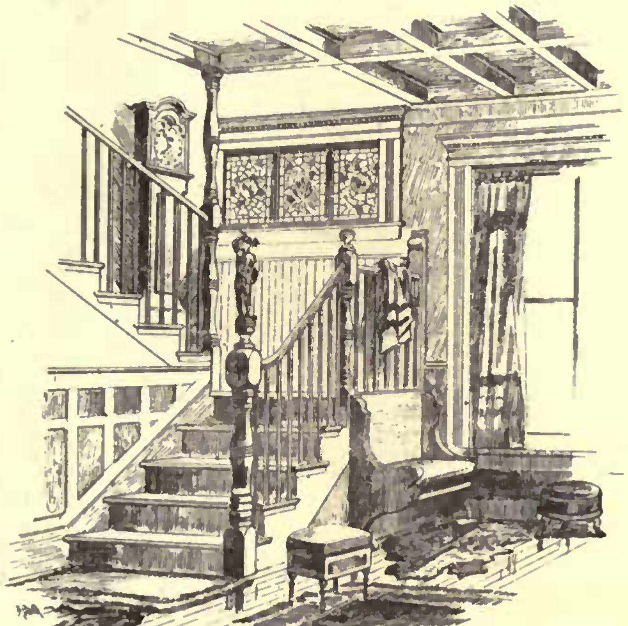


In the Vestibule.





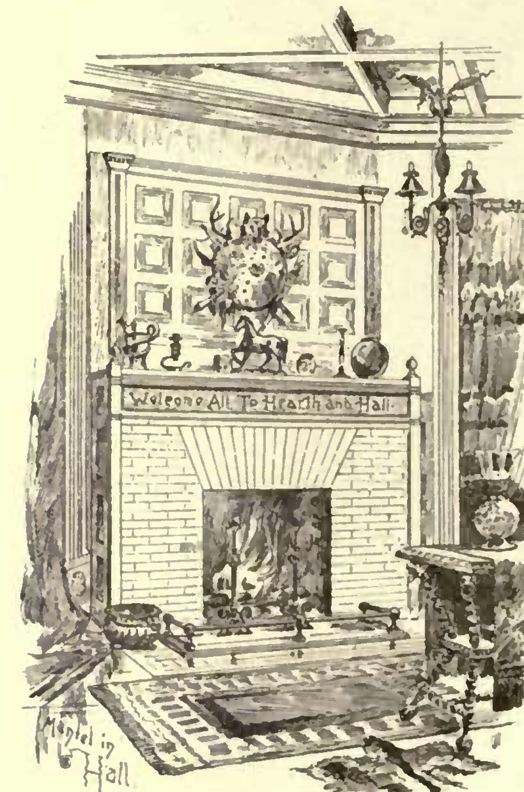
Vestibule Light.



A Glimpse in the Hall.

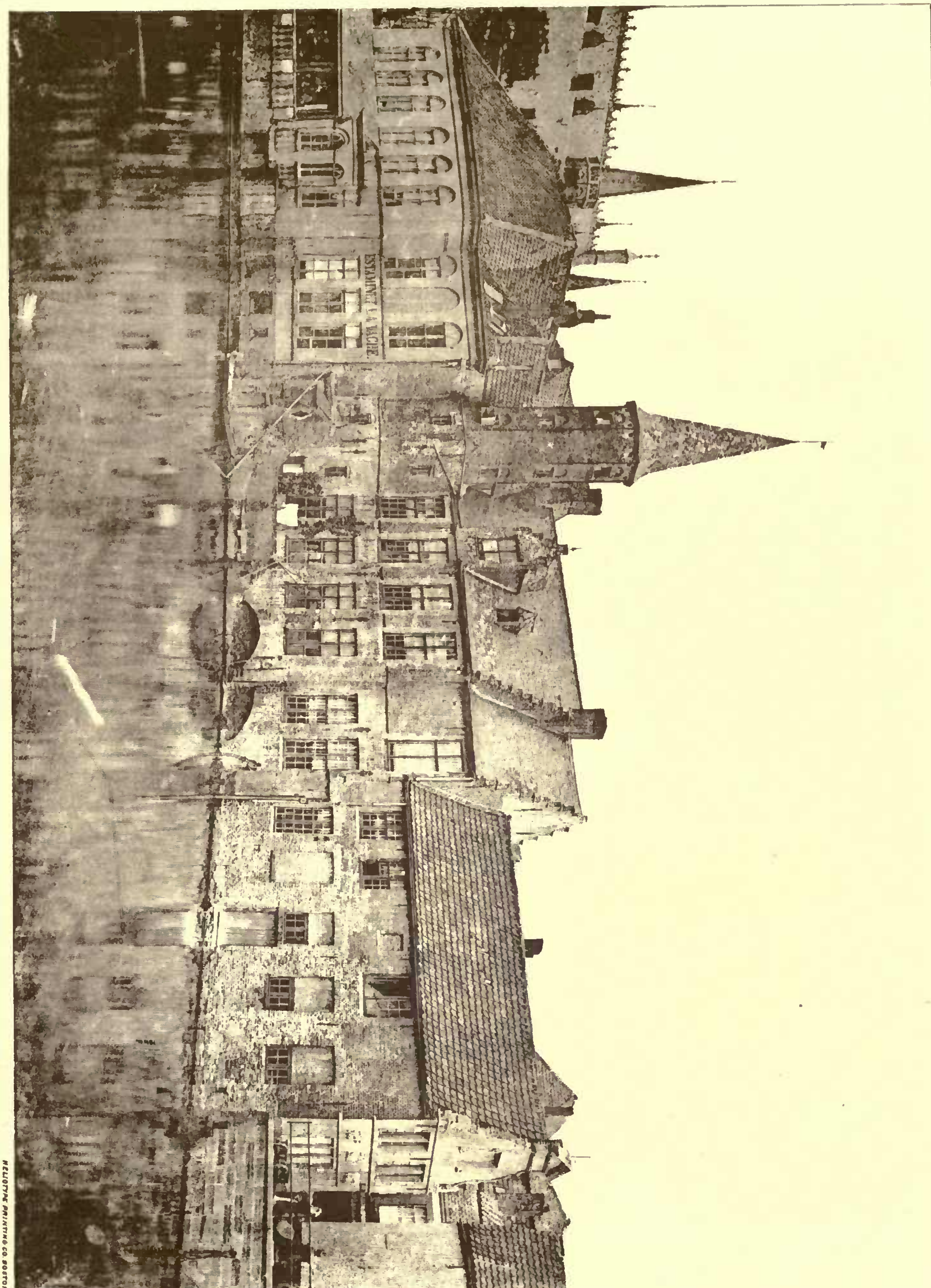


Library Mantel.



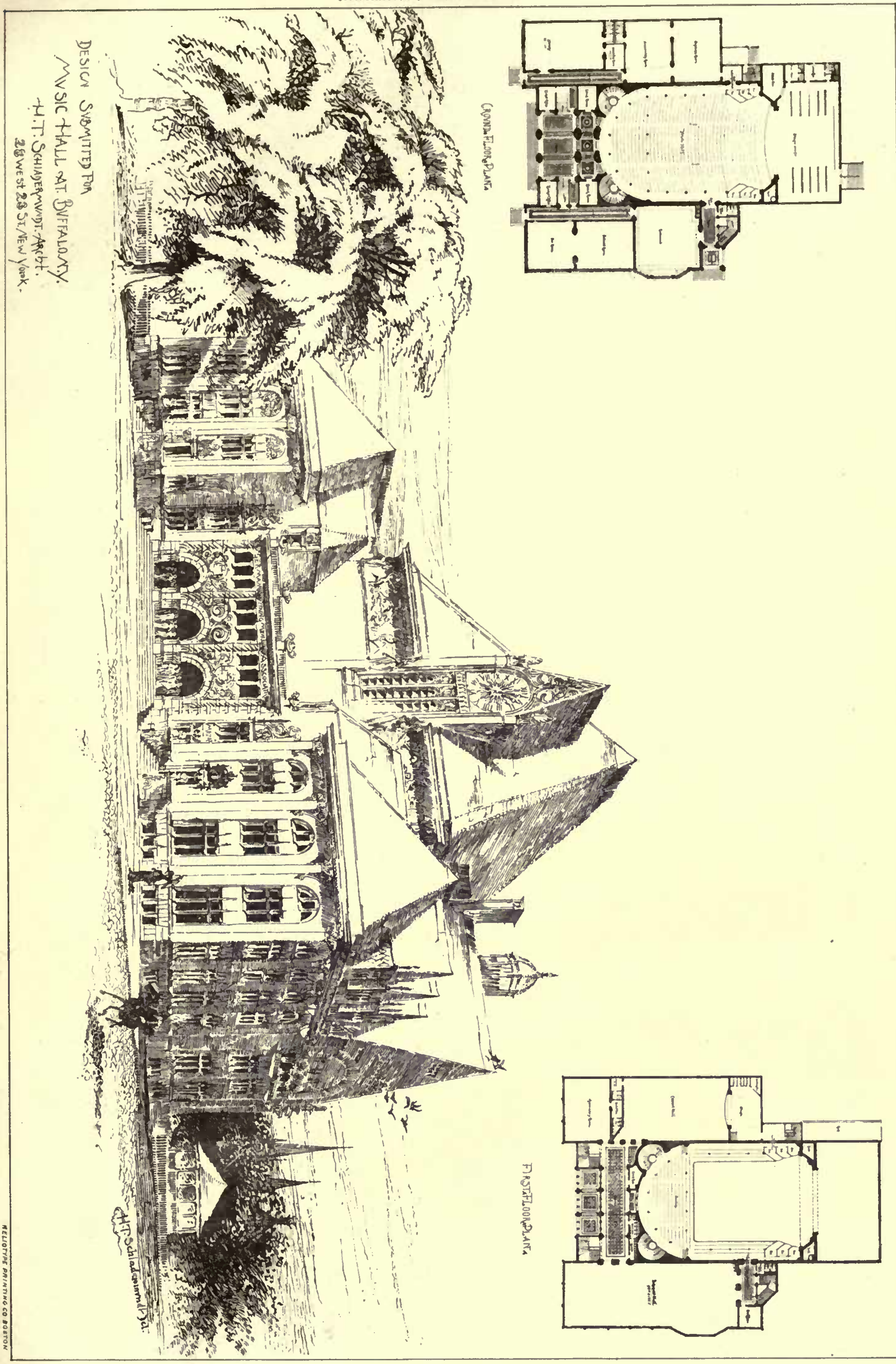
Mantel in Hall

HELIOTYPE PRINTING CO. BOSTON.



Canal at the Rear of the City Hall, Bruges, Belgium.–1884.

American Architect and Building News Sept. 5 1885 No. 506



produced was, that the smoke issuing from them blackened the top a greater distance down the chimney.

Mr. Carmichael says the chimney appears to be too large for one boiler. A coating of soot formed on the inside from three-fourths to one-and-one-half inches thick, and he draws this inference; that when a chimney is too wide, the heated air is expanded and cooled down, so as to have a sluggish motion favorable to the deposition of soot.

There was a violent storm of wind at Dundee, on Saturday, the 13th of February, 1864, which is taken notice of here, because it gave an opportunity of making some observations on the chimneys. At the height of the gale, which fortunately was between two and three o'clock in the afternoon, when most of the workpeople had gone home, the tops of both the chimneys, Nos. 1 and 2, were blown down at the same instant, making almost a simultaneous crash in falling, all the taper-top being carried away in both cases, without injury to the square shafts of the chimneys.

The gale was more violent than had been experienced for at least twenty years, as was evident from its blowing down the top of No. 2, which had stood from 1844, and also by the destruction of other chimneys and buildings in the district. Being present at the time, I was anxious so see how the chimneys behaved in such a violent storm, and this was seen to some extent by looking at No. 1 in line with the corner of a high mill, keeping the head steady. The movement was plainly visible; not a swaying motion like a tree bent by a blast, and recovering itself during the lull, but a steady rocking motion like the swing of a pendulum. The oscillation did not appear to exceed twelve inches, and the observations gave a feeling of security as to the stability of the chimney.

The tops of these chimneys were not rebuilt for some months, having to wait until the fires were out for a few days at the annual holidays. In rebuilding, the bricks were made to models in much heavier pieces than before and dovetailed together.

While the tops were off there was not much difference in the draught, the cross wall at top not being injured; but there was more dark smoke than before or after, and it did not rise so freely, but in a breeze of wind, fell down the leeward side, and clung more to the chimney.

When the tackle was up for getting to the top of No. 2 chimney, the opportunity was taken to make some observations on the heat of the escaping products, and also to see how much the outlet at the top could be contracted without injuring the draught.

With a view to this, the draught was tested for several days with the water-guage, and it showed fully .8, and at the same time the heat of flues was tested; at bottom of chimney 500° melted in one minute, 600° melted in longer or shorter time, depending upon the state of the fires.

Expecting that the temperature would be much lower at the top of the chimney, the operator was supplied with the alloys melting at 212°, 286° and 367°. These melted very quickly. Then 440° and 500° were tried, when both melted in a little more than two minutes; 600° would not melt, thus showing the temperature of the escaping products at the top of the chimney to be between 500° and 600°.

A sheet of iron was then put on the top of the chimney contracting the outlet two-and-three-fourths square feet. This was tried for two days, and did not affect sensibly either the draught or the temperature.

The outlet was then contracted still further by a larger sheet covering 5.48 square feet. This had a perceptible effect on the draught. The experiments were not carried farther, there being considerable difficulty and some danger in following them up. By contracting the outlet with a proper taper instead of merely laying on a flat plate, the contraction might have been carried still farther.

DANGEROUS STRUCTURES.[1]



IN the consideration of this subject, it will be well, for its more thorough investigation, to divide it into four headings — viz.: natural decay, defective foundations, faulty construction of super-structure, and such buildings as are erected for temporary purposes. The causes affecting the stability of buildings may be taken under chemical agencies, removal of the subsoil water, mining and underground works, unequally yielding foundations, removal of lateral support, structural alterations, overloading, wind, fire, lightning, etc. Natural decay is that most common, as the continual action of the carbonic anhydride in the atmosphere, and the alternate contraction and expansion by frost and thaw, gradually but surely (though in differing degrees according to the nature or quality of the material), cause that continual waste which is going on over the whole surface of the land. Against this action the only remedy is renewal. Defective foundations bring many otherwise noble buildings into the dangerous class, and also the use of timber below ground, removal of the subsoil water in the construction of sewers, removal of props in mining, building upon the site of ancient and long-forgotten excavations, or upon an equally unyielding foundation, such as rock stepped out. In a rock foundation, unless extraordinary precautions are used in the selection of the materials, and in the elimination of all unequal settlement from a greater number of mortar joints in any one portion of the walling than in another on the same level, any great weight in the building would crush the wall between the two unyielding forces, which would not be the case if the foundation was of a partially yielding nature, such as stiff clay or gravel. Nothing leads to more disastrous results than the use of bad bricks and odd stones in the work below ground, for it should be remembered that the lower the portion of the wall the greater is the weight to be carried. In instances of defective foundations the superstructure must be supported by raking, flying, or needle shores, while the underpinning is carefully carried out. Chimneys, from their exposed position and height, compared with the size of the base, are constantly coming under the surveyor's wing; in dealing with this class of structures, including towers and spires, the vibration caused by the wind and ringing of bells must not be taken as a sign of weakness. Mr. Cowper has said he has known a large square chimney to move one-eighth inch at sixteen feet from the ground, and some chimneys would rock as much as four inches and yet be safe. Many successful attempts have been made to straighten chimneys the foundations of which had partly given way, and by the removal near the bottom of wedge-shaped portions from the side where no settlement had taken place, and by allowing the gravity of the mass in a lever-like fashion to pull over the opposite half to the perpendicular. At Bingly, near Bradford, a chimney over one hundred and fifty feet high was brought back four feet six inches to its original state by the above-mentioned means. Faulty construction is frequently met with, being the offspring of the excessive desire of society to obtain that which is impossible at the price, and thus foster the jerry-builder and the money-lender. In buildings of this kind walls are often composed of badly-burnt bricks containing much organic matter, and held together by little more than their own gravity, the mortar generally used as the adhesive material being poor in quality and scarce in substance; the timber used in the construction is often of a flimsy kind and insecurely fixed. Such buildings as these are continually coming under the official examination of the surveyor, through the action of most of the causes already mentioned, but more particularly through the removal of lateral support and fire. Buildings of greater importance than those above alluded to may be considered to come under this heading, more particularly erections with ashlar casing and rubble backing. The fall of the tower and spire of Chichester Cathedral, in February, 1871, and that of the chimney-shaft, two hundred and forty feet high, at the Newland Mills, Bradford, on December 28, 1882, may be cited as examples of disasters of this kind, while the judicious restoration of the Cathedrals of Hereford, Salisbury, and Peterborough, and the parish churches of Grosmont in Monmouthshire, St. Mary, Stafford, and many others, demonstrate to us the value of timely repairs in protecting these ancient monuments from impending ruin. Many of these works owe their security to the judicious use of iron bands and flying-buttresses.

In all this class of work not more than from four to five feet of wall should be removed at one time. Good, clean cement-concrete should be used if possible, carefully and quietly deposited in the trench and well rammed. The new and old work should be well pinned with slates and grouted with liquid cement. Cement possesses the invaluable property of expanding as it sets, consequently causing the new work to press against the underside of the old. The best ground lime concrete, mixed in the proportion of one to six, will expand as much as three-eighths of an inch to every foot in height, and will permanently retain the size. In the underpining of a large storehouse at Chatham Dockyard, in 1834, the upper portion of the concrete was forced into the vacant space and up to the bottom of the wall by the use of a framework fitted with screws.

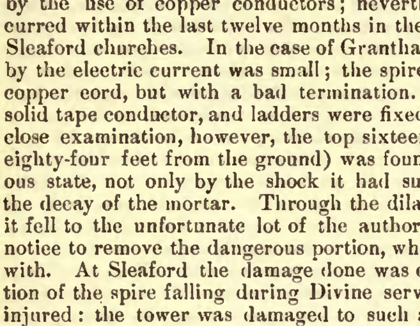
Shores should be near the top of the wall to obtain as much leverage as possible. Fir is the best wood for shores, on account of the grain being generally straight, and it is usually kept in stock in long lengths. The length of flying-shores is limited to about thirty-three feet, as fir above that length cannot easily be obtained. The timber should be sound, and as square in section as possible, truly fitted at the joints, and the shore well made, as there is always some defection in the timber and the possibility of unforeseen defects. The action of the wind or the removal of some support may cause an excessive cross strain, which, unless especially provided for, may cause a serious derangement of the work. A special foundation should always be provided for shoring, and the angle at which the sole-piece is placed carefully adjusted, sufficient room being left for the work of rebuilding to be carried on. Care should be taken, in arranging the position of the shores, to well support the chimney-breasts, piers, corbels, and any portion of a structure having extra weight. Temporary structures require especial care in the construction, particularly

[1] By Sydney G. Gamble, Asso. M. Inst. C. E., Borough Surveyor, Grantham. A paper read before the Municipal and Sanitary Engineers and Surveyors' Association, and published in the *Building News*.

those used for the reception of large numbers of people, such as stands, hustings, shows, etc. The general tendency is to make this class of structures of the flimsiest kind, on account of the short time they are used, whereas nothing is more trying to the stability of an erection than a moving load of excited people, beating time with their feet or crushing forward.

The consideration of the opposing forces necessitates great care, in order that in all cases a sufficient resisting power may be obtained to counteract any pressure likely to be brought into play. The destructive effects of lightning have of late years been much reduced by the use of copper conductors; nevertheless instances have occurred within the last twelve months in the spires of Grantham and Sleaford churches. In the case of Grantham the actual damage done by the electric current was small; the spire being fitted with a small copper cord, but with a bad termination. It was decided to fix a solid tape conductor, and ladders were fixed for that purpose. Upon close examination, however, the top sixteen feet (two hundred and eighty-four feet from the ground) was found to be in a very dangerous state, not only by the shock it had sustained, but by reason of the decay of the mortar. Through the dilatoriness of the authorities it fell to the unfortunate lot of the author of this paper to serve a notice to remove the dangerous portion, which was attended to forthwith. At Sleaford the damage done was of a serious nature, a portion of the spire falling during Divine service; happily, no one was injured: the tower was damaged to such an extent that rebuilding of the tower and spire became necessary. Had a conductor been fixed, and the suggestions made in the report by Mr. Kirk, the architect, in 1852, been carried out, doubtless the tower would at the present moment have been standing in its original condition. The action of fire upon walls is usually of a very serious nature, causing many a fine stone building to come tumbling about the fireman's ears, and those having charge of the fire-brigades well know the effect of fire upon the igneous and limestone rocks, and the danger incurred by throwing water upon red-hot substances. The fumes from furnaces in which only coke is burnt have a great disintegrating effect upon brickwork, the author having in his possession a brick, taken from the top of a chimney, eaten away two and one-half inches out of the four and one-half inches in thickness.

DECORATION AND FURNISHING.[1]



Carved Wood-Work.—Church at Urne. France.

I WOULD advise you, especially as I suppose I am expected to speak on this question from an artist's point of view, to select the most cheerful, light-giving colors, and combine them in perfect harmonies. Be sure that few things are more injurious to health—especially the health of the mind and the eyesight—than dark, heavy, inharmonious colors and combinations of strong opposites. The presence in your rooms of masses of black and white in juxtaposition, and such crude arrangements, are calculated to affect injuriously both the mental and physical eyesight.

Doctors will tell you how much people of weakened intellect are influenced by their surroundings of color; how the madness of a wildly excited lunatic is increased when left in a room with a red paper or red blinds, and how, if taken to a room the colors of which are blue, he will sink into comparative quiet. Another melancholy lunatic can be cheered and helped into a sounder frame of mind by living in red and yellow rooms.

Now, as we are told that we are all insane on some one point or another, it behooves us carefully to examine ourselves and discover if our madness be rampant, quiescent, or melancholy, and so arrange our immediate surroundings as best to meet our several cases.

The difficulty we must face and master is to discover just what those colors are which, while suiting our various temperaments, will keep their color, resisting outside influences. Now, taking it as a fact that in this climate we do suffer more from melancholy madness than from an exuberantly high-spirited one, because we are so short of pure, direct sunlight, we must do all in our power to supply that which is wanting. Our colors must simulate as nearly as possible the light and warmth we lack. That is to say, reds and yellows must form the staple colors for our walls, ceilings and floors. I do not argue that we must exclude blues and greens from our palette; no harmony is complete without its fair admixture of all the colors that Nature gives to us. You would lose the power of detecting reds and yellows if you used no other colors to compare them with.

In the decoration of a cornice the color scheme of which is red, I have employed several shades of green and of blue. You will observe the effect these light lines of green and blue have; they divide the reds and yellows, giving power and value to each in the composition. If I had employed one of the colors—the brown, green or red—of the paper, and tinted my cornice merely in shades of it, I should have formed a distinctive band of one overpowering color, too powerful and massive to harmonize with the well-balanced scheme of colors as shown in the paper. It would have become in the room the one object of striking importance, and would so have destroyed its harmony or restful repose, and would have been as much out of place with this many-colored paper as the rich cornice would have been in a whitewashed cellar.

In the decoration of a room great care should be taken that no color or object forces itself on the attention, except it be the one worthy object round which all interest centres. Even it must be modest. But the actual decoration, *i. e.*, the painting and papering, with which we are now dealing, being, as it were, the mantle covering the skeleton of the room, must form only the background against which all other objects stand, and it must be placed there with the kindest consideration for these objects.

Being, therefore, anxious that our walls shall not force themselves upon the attention, reminding us of the narrow boundary of our rooms, we must treat them in color, together with the ceiling, cornice and wood-work, just as Nature out of doors treats her landscapes. Her colors are pure, not half-tints, and so some people tell us ours ought not to be for indoor work, but they forget the important item, not present indoors, of atmosphere, the kind veil Nature draws over crudities; and they forget also this, that every color in a landscape is softened to the eye of an observer by its next-door neighbor; that from every inch of the mile of landscape he is examining, some different ray of color is darting to the retina of his eye, and so producing on his senses the effect of color we endeavor to imitate in these so-called half-tints. Fashion has done a great deal for us lately, and we see all the shops full of lovely colors. I only fear their mixing them to such an extent that we shall require some delicate instrument to detect one from another.

For a moment I will return to the colored cornice. When I painted this I put on my palette some white paint; three kinds of yellow, raw sienna, yellow ochre, and chrome yellow; two blues, indigo and Prussian; three reds, burnt sienna, Venetian red, and my one positive color, vermilion; three browns, raw umber, burnt umber, and Vandyke brown; and in each one of the tints shown in the arrangement there is some particle of every color on my palette, so having the effect of various rays of light upon each other.

This theory you should formulate into a rule, to guide you in the selection of the various items of furniture and decorative carpets, curtains, wall-papers and covering materials. It might be said with truth that a beautiful arrangement of color, calculated to give every satisfaction to the eye, and so pleasure to the mind, is as injurious to the constitution, if it be made of poisonous pigments not secured to the wall, but removable by friction or every draught of air, as if the color were a bad one. Just as it is said from the point of the colorist that, however wholesome the materials may be, and however well fastened on to their various surfaces so that they have no injurious effect upon the physical frame, they still, being of unsuitable and inharmonious color, have a prejudicial effect upon the health, acting through the eye and mind. It is necessary, therefore, to understand and give practical effect to both requirements.

In selecting papers, you must above all things assure yourself that they are free from arsenic or other poisonous substances; that the colors are not loaded-on so that they are readily removed by friction; or, if you elect rather to paint your walls, or even simply to distemper them, see that the colors are well mixed with a proper amount of glue size, new and sweet. Be particular to have the paint well mixed, so that it may be applied in thin coats, and not loaded in such a manner that the slightest friction will remove it. This injunction applies also to cornice and ceiling.

The wood-work must of necessity be painted in oil-colors, if it has not from the first been simply stained and varnished. I could wish very much that this practice were more common, if it were done with care and thought. Even amongst the commonest deals that are used in the construction of ordinary houses there is much room for choice. The door-panels, being picked from the most nicely pencilled and marked grain, will, when carefully stained to a good rich brown, reveal a delicate pattern, more beautiful than any stencil design you will be able to apply. I would avoid studiously those ugly yellows and imitations of mahogany one so often sees, and cling to good harmonious self-colors, trusting to the natural grain of the wood for relief.

Good hard-oak varnish on this stain, carefully and thinly applied in two or three coats, allowing ample time for setting between each, is, while more costly in point of labor, very little more so in material than if it be loaded on in thick, treacly masses, and, for service, infinitely more lasting. But if you must have the wood-work painted because it has been so before, put on the colors with the same care I advise for the varnishing. Two coats of properly-mixed color are better than six of badly incorporated oil, turpentine, dryers, and half-pulverized powder. When the paint is ready, or you think it is, for applying, test it by placing a little on the thumb-nail, and if you perceive, when rubbing the other nail over it, a gritty sensation, be sure the paint is not fit for use, and reject it. I do not say this simply because it will make you a bad and unpleasant surface, like sandpaper, when dry, but for this important reason, that all those bits of grit are so many particles of matter injurious to health, and in some cases actually poisonous. They are easily removed by friction, and so are liable to fly and lie about, to get on to the lungs or

[1] Extracts published in the *Artist* from the lecture delivered by Mr. G. F. Armytage, at Manchester, England.

into the pores of the skin. The paint, if properly mixed, should form a surface like the lacquer the Japanese cover their goods with.

Bear carefully in mind what I have said about choice of color. By preference, cover your ceilings with a slightly-patterned paper with a machine-glazed surface; it looks clean longer and keeps clean longer, the smooth surface rejecting particles of soot or dust.

Select a very quiet, small, geometrical pattern, and let the tint of it be in two shades of vellum. It is of course an excellent thing to paint the ceiling with four or five coats of paint in oil-color, as then it can be regularly washed; but this is an expensive piece of work. Paint the cornices, as I have shown you, in oil or distemper, and if you can manage it, and intend to remain in your house for eight or nine years, give your walls three or four good coats of oil paint, and stencil them all over in some neat, good pattern. This will provide you with many an evening's pleasant work when you have settled down, and when well done will be a lasting joy to you. Of course, if you must paper — for I do not much advise distempering the walls, being all one plain surface it shows at once every spot and mark, and it is not worth the labor of stencilling — there are now-a-days ample sources from which to select cheap papers good in design and color. Remember always to keep a harmony of color and design. Color is perhaps the first thing for you to grasp when thinking of the decoration of your houses; design must naturally follow on this, not precede it.

Now it is just possible some one may be inclined to laugh at all I have said, and attempt to point out that although there may be some sense in it, it is an absurd thing to press the desirability of such precautions being taken by workingmen, for I suppose by the title of this series of lectures that I have the pleasure of addressing such. I can understand as well as any that in the present condition of things, and the relation of landlord and tenant, there may be considerable difficulties to be overcome that may appear at first sight absolutely insurmountable. But all the difficulties and impossibilities you can arraign against me do not in the least affect the necessities of the case. If you would be healthy in your houses, and would have your children healthy, you must take these precautions.

We will suppose for an instant that you are in a comfortable position, and as sure as one can be of anything here below of good and regular work; you are naturally anxious to possess a place of your own, or to get one on a decent lease. Having done this, your duty is plain. Have you a greater respect for the doctor and the fever hospital than for your fellow artisans? To which do you prefer to pay the money? For it must be to one or the other. And which, I would ask you, is the better investment? In the one case you pay and have in exchange anxiety, pain, and very possibly the loss of some of your little ones to deplore, and no stock-in-trade left. In the other you pay, and for your money you have a bright, cheerful home, all freedom from anxiety of sickness from that cause at any rate, and a stock of paint and paper that will last you with ordinary care for four or five years. Just once a year, at cleaning time, you must spend a few shillings to scrape down and color-wash your ceilings and any parts of the work that are at all calculated to retain anything noxious.

And now respecting the furniture and other items necessary to make the house a home. For general principles: Do not overcrowd; do not have large, bulky things that are hard to move, that are too high to reach to the top of and dust, that take up too many cubic feet and inches of the precious air which in small rooms is a matter of great consideration.

Do not add to the day's toil a night of hard labor with a heavy cotton quilt or one of those heavy, old-fashioned bed-rugs. The clothes should be just eight inches or ten inches on each side of the bed wider than it is, but not more.

For the remainder of the furniture, if you will follow the rules I have already suggested as to its size and the wood it should be made from, I do not think there is anything further to suggest from the healthy point of view.

About the curtains and carpets there is a good deal of difference of opinion. Their presence in a room adds so infinitely to its comfort and pleasant appearance that one would be tempted to use them on the ground that what produces pleasure is as good for body as the mind.

Do not, of course, admit thick, clumsy materials in heavy folds that are difficult to push away from the windows and exclude light and air, or that hang on to the floor, and allow in their folds the secretion of dust and dirt.

You know the old-fashioned manner of draping windows; it had its uses long ago, before they knew how to hang windows, when it was necessary to provide an effectual screen from the draughts that would force their way through; they then hung over the upper part of the window, from a closely-fitted wooden cornice, a valance, behind which the curtain ran on a pole, but this valance was a tightly-fitted kind of apron and had its purpose to serve; not so the ridiculous substitute men put up now-a-days merely to imitate what had a meaning. The modern base imitation has no meaning or reason for its being. Let us therefore drape our windows with only so much material as will make them pretty and give a comfortable appearance when drawn at night, and for this it is not necessary that two or three feet should drabble on the floor. Many people tell us that on no account must we entirely cover floors with carpet. A margin must be stained two or three feet all round the room, and the carpet laid in a square in the centre, the margin being varnished. The idea of course is that the carpet, not being held down by heavy pieces of furniture, usually placed against the wall, can be more easily taken up and shaken, and the smooth varnished floor all round is so much more easily dusted or wiped over with a wet cloth; and all this is indisputable. But if these precautions are not taken (and my experience tells me that in the majority of cases they are not) this manner of covering the floor is no whit more wholesome than the all-over carpet. The times and seasons for the taking up of carpets and the scouring of floors are indelibly fixed in the minds of mortals, and new-fangled notions, if we can call them so, cannot overcome such prejudice. I am almost prepared to maintain that with the varnished margin there is the greater risk, unless it be cleaned oftener than the carpet. We are told that the germs of disease, flying in infinitely small particles in the dust, are taken on to the lungs and so fulfil their mission in us. You have noticed how quickly a cloud of dust is set in motion from a smooth surface, whereas a rough, porous material, as a carpet, will hold the particles. These particles of dust and germs of disease ought not to remain in the carpet, but if they must be somewhere, they are better there than on your lungs. Rather than say to you: "Cover your floors all over with carpet," I would say, "Whether you cover them all over or lay your carpets in squares in the centre of the floors, you must use the same precautions and prevent the accumulation of dust." These remarks concerning carpets and curtains will of course apply throughout houses. But I do not know what more to say than I have done concerning other articles of furniture, unless you will permit me to use again the argument I used when speaking of color, that those combinations which are subtle and true in their harmonies have a more healthy effect upon the mind than the heavy, unsuitable ones. So, I can conceive, the beautiful form that brings the imagination into play, and gives room for thought, must affect the physical health through the mental. Certainly couches and chairs that are comfortable and restful, so being really artistic by rightly fulfilling their destiny, are more conductive to good health than others designed without this consideration. Designers should think more of this and be less haunted with the desire to produce something novel, and remember that "Construction should be decorated, decoration should never be purposely constructed," and also "That which is beautiful is true; that which is true must be beautiful." And then our shop windows and houses will cease the display of tawdry, comfortless and useless rubbish with which they are filled to-day.

WHO SHOULD PUT UP THE CRESTING?

OSSIAN, IOWA, August 29, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — A difference of opinion has arisen between the owner and the contracting carpenter of a building with a French roof, deck of roof covered with tin, sides of roof covered with shingles. The owner has purchased a cast-iron cresting for enclosing the boundaries of deck roof, and thinks the carpenter should put it in place. The contract engages the carpenter to perform faithfully, etc., all work embraced in his department of work on the building. Now the dispute hinges on the question, whether it is the carpenter's part to put up the cresting, or whether it does not belong to the sheet-metal worker and tin-roofer? All hardware and sheet-metal and all tin-roofing work for the building is furnished and paid for by the owner. An answer, by letter or through the columns of the *American Architect*, will be thankfully received.

ELIAS G. AURAND.

[WE incline to the opinion that putting up a cresting should be considered a part of the contract of the metal-worker on any job, as the metal-worker and not the carpenter is to be held responsible for the tightness of the roof, and it is for his interest to see the work properly done by competent carpenters in his employ. Moreover, in this case as certain work is especially reserved by the owner for his own attention, the inference is that the carpenter can be held only for work specifically required by his contract and specification. — EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

CONSUMPTION OF WATER IN BROOKLYN, N. Y. — The daily consumption of water in Brooklyn is 45,000,000 gallons, an increase of from 7,-000,000 to 10,000,000 gallons as compared with the same time last year, and some alarm is felt by the officials in view of the recent drought.

MINNESOTA'S LUMBER TRADE. — There was an increased output of lumber from Minneapolis during the last week, amounting to eighty cars, and a reduction of the output from St. Paul of forty-three cars. Trade is gradually creeping back to fall activity. It is expected that the proposed advance of $1 per 1,000 feet on several of the common grades, which goes into effect September 1, will result in many dealers making purchases this week. The dealers are not as confident of their ability to maintain the rise as they were after the May meeting, though it is fully warranted by the conditions of the stocks and prospective demand. The seven mills are being run steadily, but there is every indication that stocks of sawed lumber will not be in excess of stocks a year ago at the end of the season. Dimension is still scarce in this market and the advance will be more easily maintained on that than other classes. The local lumber market is especially good, and it is estimated that about 325,000,000 feet of lumber will be consumed this year in St. Paul and Minneapolis. This is more than will be made by the Minneapolis mills. — *New York Tribune.*

CROWS AND CHOLERA AT RATISBON. — In the ancient town of Ratisbon, Bavaria, there was much excitement during the early part of last month because the crows which abounded in the spires of the venerable cathedral disappeared as if by magic. A similar occurrence was noted in 1873, just before the appearance of the cholera, and hence the excitement.

TESTS OF THE SIEMENS GAS-BURNER. — The *Journal of Gas-Lighting* gives a description, by Mr. Frederick Siemens, of a new gas-lamp in which the main object has been to light only by means of indirect rays or diffused light. The following tests of this lamp have been made: The burners or jets removed from the domes were tested with the rays horizontal. The consumption of gas was 20 cubic feet per hour, and the illuminating power 57.5 candles, or 2.875 candles per cubic foot. They were then placed at an elevation of one foot six inches perpendicularly over a plane glass mirror placed at an angle of 45°, and in a line with the disk of the photometer. The distance from the standard light to the glass reflector was eighteen feet six inches, which, added to the one foot six inches that the burners were placed above the reflector, made together twenty feet, the distance at which the light to be tested has to be fixed from the standard light in the photometer employed. In this case the consumption was again twenty cubic feet per hour, and the illuminating power was found to be 55 candles, or 2.75 candles per cubic foot, so that it would appear that there was an absorption by the glass in reflection of 4.35 per cent.

The burners having been fixed in the dome reflector, the lamp thus arranged was again tested, as in the last experiment. The consumption of gas was 20.5 cubic feet per hour, and the illuminating power 62.5 candles, or an average of 3.048 candles per cubic foot of gas, or 3.180 candles per cubic foot if the 4.35 per cent found to be absorbed by the glass are added. The difference between 2.875 and 3.180 candles, or 0.305 candle per foot, gives the increase of light due to the use of the reflecting cone. After burning for some time the lamp was again tested. The consumption of gas was found to be reduced to 15.5 cubic feet per hour, and the illuminating power to be increased to 115 candles, being an average of 7.42 candles per cubic foot, or, allowing for loss by absorption, 7.74 candles per cubic foot. The difference between this and 3.180 candles, or 4.560 candles, gives the gain in light per cubic foot of gas due to the regenerative arrangement, the gas burning within a highly-heated atmosphere.

THE LESSONS OF NAUCRATIS. — The historical interest of Naucratis is very great; but its archæological interest, especially in all that relates to the ceramic arts, is greater still. Favored by its charter and constitution above other commercial cities of the Delta, Naucratis was not only the meeting-place and mart of all the seafaring traders of the Mediterranean basin, but it was also the headquarters of a local trade of the highest importance. Naucratis was a city of potters, and her wares, according to the testimony of Athenæus and others, enjoyed a great reputation. This being so, we are not surprised to learn that the mound of Nebireh is one vast Monte Testaccio — a hill of potsherds, deposited in strata as well defined and as strictly capable of chronological classification as the strata in a geological diagram. Mr. Petrie has trenched through and cleared away these strata, going sometimes to a depth of six feet below the hard mud at the bottom. Each layer has thus in turn rendered up its story, and the story of each layer proves to be a chapter in the history of Greek art. Now, for the first time, every link in the chain which connects the pottery of Greece with the pottery of Egypt is brought to light. That connection is not one of partnership, but of descent. We have long known that the early Greek, when gradually emerging from prehistoric barbarism, must have gone to school to the Delta and Valley of the Nile. The excavation of Naucratis not only confirms this view, but shows us the actual process of teaching on the part of the elder nation, and of learning on the part of the younger. To be convinced of this initial fact in the chronicle of Hellenic art, it is only necessary to visit the small collection of representative objects lately forwarded from Nebireh by Mr. Petrie, and still on exhibition in the First Bronze Room at the British Museum. We here see grouped together, much as they might elsewhere have been seen grouped together for sale or barter in the market-place of Naucratis, such wares as found purchasers among the people of both nationalities thereabouts — scarabs, amulets, and fantastic gods in colored and glazed pottery for Egyptians from the neighboring villages; figured and painted cups, bowls and vases, terra-cotta statuettes and the like, for Greek folk of the city, and for exportation to the trading ports of Asia Minor and the islands of the Ægean. These alabaster deities of old Nile, this quaint dwarf god in green faïence, whose native name was Bes — these pectoral ornaments and sacred emblems of the eyes of Horus, might have been sold by dealers from Tema-en-Hor, the "City of Horus" (modern Damanhur), and paid for with yonder archaic silver tetradrachmas, then fresh from the Athenian mint. Among those figured wares designed by local Milesian potters, we find the earliest example yet discovered of the pattern commonly known as "Greek honeysuckle." But, curious to relate, this ornament, as shown in its most archaic stage, turns out to be no honeysuckle at all, but a new and fanciful rendering of the time-honored Egyptian lotus-pattern, remodelled and transformed by the light hand and inventive genius of the alien artist.—*London Times, August* 5.

THE EL FAYOUM MANUSCRIPTS. — It is said that the El Fayoum manuscripts belonging to the Archduke Renier of Vienna, when fully deciphered, will probably revolutionize ancient history. There are altogether 30,000 fragments in eleven different languages. Some of them date back 3,000 years, and the most modern bear the date 953 A. D. They are believed to have formed part of a great library. It is now possible to write the narrative of a thousand years of Egyptian history about which very little has heretofore been known, and of Roman history beginning 93 A. D., through the consecutive reigns of thirty-five Emperors, closing with Constantine the Great, from contemporary documents of every year of their reigns. They are destined to shed light upon some of the darkest periods of history, especially the time when the power of the Byzantine Emperors gradually lapsed into the hands of the Moslem conquerors, the reigns of the Ptolemies still farther back, and the period during which Egypt was under the sway of Persia.

FACTS ABOUT THE WINTER PALACE. — The Winter Palace, although constructed by the Empress Elizabeth, was not completed until Peter III ascended the throne, and the square in front of it was still covered with the shops and huts of the workmen. Heaps of stone, bricks, and rubbish obstructed the approaches to the palace. In order to clear the place Baron Korff, who then filled the post of Chief of Police at St. Petersburg, proposed to the Emperor to give permission to the poorer inhabitants to carry away these unused materials. The plan pleased the Emperor and orders were immediately given to carry it out. The Emperor witnessed from his windows the operation which was completed by the evening. The Emperor on installing himself in his new palace occupied the part looking onto the square and the corner of the Millionnafa. This portion of the palace bore the name of the King of Prussia's apartments. The occupation of the palace was accompanied by no extraordinary ceremony. The rooms occupied by Peter had been decorated by the architect Tchevakinsky, a pupil of Bastrelli, and the flooring and gilded cornices were brought from Italy. Peter's bedroom was in the extreme wing, and beside it was his library. Above the entrance door he caused a gallery to be constructed which he turned into his working cabinet and furnished at a cost of more than 3,500 rubles. The Empress Catherine occupied the rooms afterward known by the name of the Empress Marie Feodorovna. The day the Court occupied the Winter Palace (7th of April, 1762), was marked by the consecration of the palace church under the name of the Resurrection. Later on, in 1763, on the occasion of an ancient image of Christ being removed to the church, it was consecrated afresh by order of Catharine II as that of the Saviour. The embellishment of the interior and the furnishing of the palace were continued under Peter and only completed by Catherine. The total outlay up to the year 1768 was estimated at 2,622,020 rubles, or about £400,000. The principal director of the works in the interior was the celebrated amateur, Jean Betzky. In 1767 the annex of the palace destined to be the Hermitage was commenced, the architect Delamotte being entrusted with its execution. This building, oblong in shape, extended from the Millionnafa to the Quay. Four years later a second building was erected on a plan of the architect Felton. In 1780 several fresh wings were added, and the Empress ordered the architect Guaranghi to build a theatre which was at the latest to be completed by August, 1784. The same architect erected the arch connecting the Hermitage with the theatre and with the part of the palace containing the Raphael galleries. In 1786 the marble gallery (containing the Hall of St. George and the Throne room) was commenced, and in 1794 a superb throne was placed in the former. This throne was the masterpiece of the architect Starow. — *Exchange.*

MR. PETRIE ON THE GREAT PYRAMID. — Mr. Petrie is minute in his observations of the injury that the King's Chamber, the chamber containing the sarcophagus in the Great Pyramid, has sustained, apparently by an earthquake. The joints of the stones have been loosened on every side, and the great beams of the ceiling, weighing about fifty-four tons each, have been broken right through on the south side, and the chamber actually holds together only by the force of sticking and thrusting; its eventual downfall is, as Mr. Petrie says, "a mere question of time and earthquakes." As one of these cracks and many of the joints have been daubed up with mortar, it seems that the injury must have occurred before the Pyramid was finished. The sarcophagus, in which great interest was centred by Professor Piazzi Smyth's theory, as it was supposed to exhibit a standard for all the Pyramid dimensions, is found by Mr. Petrie to be rather a careless piece of work. Marks of the saw which still remain show that the masons have more than once cut deeper than they intended, and have then tried to polish away their mistakes, but without wholly succeeding. The coffer was raised to see if there were any marks underneath it to indicate that it stood in its original place; but no such marks were found. Mr. Petrie gives some interesting details relative to the change that took place in the workmanship of the Pyramid in the course of building. The site was levelled with great care, and the base laid out with wonderful exactitude. The basalt pavement on the east side of the Pyramid and the limestone pavement on the other sides are splendid pieces of work, the blocks of basalt being all sawn and fitted together with the greatest accuracy. The lower part of the casing, of which Mr. Petrie for the first time uncovered some blocks *in situ*, is exquisitely wrought, and so is the Entrance Passage; "the means employed for casing and cementing the blocks of soft limestone, weighing a dozen to twenty tons each, with such hair-like joints, are almost inconceivable at present, and the accuracy of the levelling is marvellous." But the same excellence is not shown in the upper parts of the building; the upper part of the Great Gallery is much askew; in the ante-chamber, bad stone has been employed, and its defects rudely plastered over; and in the King's Chamber, though it is composed entirely of magnificent granite blocks of admirable workmanship, there is an error in the levelling, causing a difference of two and a quarter inches between the courses on the north-east and the south-west, an error which, if not due to natural causes, is surprising in such a piece of work as the Great Pyramid. In many places the stone has been left in the rough, to be dressed down when it was put in position, but which has been left undressed. Mr. Petrie suggests that the architect of the first period of the building died in the midst of his work, and was succeeded by one who exercised less careful supervision, and that thus the building was somewhat hastily finished. As the roofing-beams for the King's Chamber are all numbered, and marked for the north or south sides, Mr. Petrie thinks it probable that they were all hewn in the lifetime of the first architect, and fitted into position outside the Pyramid, but were built into their place by the second and less careful architect. — *Chambers's Journal.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

324,357. SAW.—Matthew Brown, Bridgeport, Conn.
324,368. HINGE FOR SCUTTLES, SKYLIGHTS, ETC.—Patrick Curley, Boston, Mass.
324,378. PIPE-WRENCH. — James T. Hayden, Boston, Mass.
324,384-385. SLIDING BLIND. — Nathan Jewett, Toledo, O.
324,395. ELLIPSOGRAPH.—Arthur Marichal, Philadelphia, Pa.
324,444. LOCK-HINGE.—Josef Wolf, Hoboken, N. J.
324,452. DOOR-CHECK. — Nathan O. Bond, Fairfax Court-House, Va.
324,456. PORTABLE BUILDING.—Thomas R. Carskadon, Keyser, W. Va.
324,460. SHUTTER - FASTENER. — William Delano, Brooklyn, N. Y.
324,492. GAS-TRAP COVER FOR WASH-BASINS. — Nathan Schwab, New York, N. Y.
324,493. ELEVATOR - CAGE AND SAFETY APPLIANCE.—Alonzo B. See, Brooklyn, N. Y.
324,499. GLAZING.—Thomas W. Taylor, Worcester, Mass.
324,500. PNEUMATIC ANNUNCIATOR. — William Thomas, Jersey City, N. J.
324,508. COMBINED AQUARIUM AND MARITIME THEATRE.—Jerome Wenmaekers, Antwerp, Belgium.
324,515. WATER-BACK.—Frank Armstrong, Bridgeport, Conn.
324,525. BARN-DOOR FASTENING.—Wm. L. Bliss, and George F. Kopp, South Egremont, Mass.
324,527. COMPOSITE METAL BAR.—Edwin S. Brainard, Manchester, Conn.
324,542. OVERFLOW AND DISCHARGE VALVE FOR BATHS.—John Demarest, New York, N. Y.
324,544. SAFETY-GATE FOR ELEVATORS. — George T. Fallis, St. Joseph, Mo.
324,555. BENCH-CLAMP.—Franklin P. Hish, Shelbyville, Ill.
324,634. CONSTRUCTION OF BUILDINGS.—James C. Anderson, Highland Park, Ill.
324,640. KNOB ATTACHMENT.—John Bellamy, Boston, Mass.
324,645. SEWER-TRAP.—Buckland P. Bower, Cleveland, O.
324,670. FIRE-ESCAPE.—William B. Doolittle, Chicago, Ill.
324,693. BLIND-SLAT HOLDER. — David Hinman, Southington, Conn.
324,695. CRANE. — Jos. Hollingsworth, Kilbourne, La.
324,710. FIREPLACE NICHE.—James N. Long, Philadelphia, Pa.
324,716. FIRE - PROOF CEILING. — Henry Maurer, New York, N. Y.
324,732. METALLIC DOOR-SILL.—Charles C. Schreiber, Cincinnati, O.
324,751. SAFETY DEVICE FOR ELEVATORS. — Robert M. Curtiss, Brooklyn, N. Y.
324,763. BORING-PIT OR AUGER. — Lucian M. Foster, Troy, N. Y.
324,768. TUBULAR SCREW. — Frederick R. Hunt, Leavenworth, Kans.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty-three permits have been granted, the more important of which are the following: —

J. M. Shackleford, three-st'y brick building, n e cor. Eden St. and Union Alley.

Henry Hartman, 2 three-st'y brick buildings, w s Pennsylvania Ave.; and 6 two-st'y brick buildings, e and w s Wilmer Alley, bet. Biddle and Greenwillow Sts.

C. A. Gambrill M'f'g Co., two-st'y brick building, 36' x 38', e s Commerce St., s of Pratt St.

Johns Hopkins University, four-st'y brick building, n e Monument St., bet. Eutaw and Garden Sts.

Swindell Bros., three-st'y brick building, 25' x 120', n e cor. Bayard and Warner Sts.

J. J. Gordon, three-st'y brick building, s e cor. Aisquith and Lauvale Sts.

E. T. Kirkley, greenhouse, s s Myers St., bet. Webster St. and Fourth Lane.

H. A. Zeigler, 3 two-st'y brick buildings, e s Valley St., s of Hoffman St.

Wm. Collett, 6 two-st'y brick buildings, w s Pennsylvania Ave., com. cor. Gold St.

Otto Goldback, 5 three-st'y brick buildings, e s Wolfe St., com. cor. McElderry St.

Chas. Callis, 10 two-st'y brick buildings (sq.) e s Broadway, bet. Preston St. and Carlisle Pl.

P. Fitzpatrick, 4 three-st'y brick buildings, e s Charles St., s of Jones Falls.

F. W. Koenig, three-st'y brick building, e s Hanover St., bet. Clement St. and Fort Ave.

Adam Wendell, 2 three-st'y brick buildings, n s Eager St., bet. Greenmount Ave. and McKim St.

Chas. Buck, three-st'y brick building, e s Pennsylvania Ave., bet. Hoffman and Dolphin Sts.

Boston.

BUILDING PERMITS. — *Wood.* — *Congress St.*, opp. A St., storage, 50' x 100'; owner, Boston Wharf Co.; builder, N. S. Wilbur.

Milton St., near Byron St., dwell., 21' x 30'; owner, Nathan Erskine; builder, C. W. Nickerson.

Garfield St., near Corey St., dwell., 31' 2" x 32' 2"; owner, J. W. Bailey; builder, George A. Spear.

Dorchester Ave., No. 317, wagon-shed, 22' 6" x 74'; owner and builder, William Peard.

Savin St., near Blue Hill Ave., dwell., 20' x 66' 6"; owner, J. R. Murphy; builder, John Hayes.

Everett St., carriage-shed, 30' x 40'; owner, G. C. Fitzpatrick; builder, Isaac G. Caswell.

Rutherford Ave., stable, 32' x 34'; owner, D. Whiting & Son; builder, J. B. Wilson.

Medford St., opp. Walnut St., storage, 24' x 90'; owners and builders, Holmes & Adams.

Harvard Ave., near Brighton Ave., stable, 24' x 34'; owner, G. P. Brown; builders, Watson & Bowers.

Magnolia St., cor. Myrtle Pl., dwell., 24' 6" x 29' 8", owner, William T. Leggett; builder, Burke Bros.

Ruggles St., No. 32, storage, 28' x 56'; owner, W. J. Bradlee; builder, A. J. Strout.

East Sixth St., No. 455, dwell., 15' x 21'; owner and builder, James V. Devine.

Dudley St., near Dennis St., dwell., 22' x 50'; owner, Charles Barton; builder, James Portmore.

Pleasant St., near South St., storage, 25' x 50'; owner and builder, Boston Gas Light Co.

Vaughan Ave., near Geneva Ave., dwell., 17' x 28'; owner, John Watson; builder, B. A. Noble.

H St., near East Fourth St., dwell., 21' 6" x 42'; owner, Dennis Reardon; builder, Lyman Locke.

H St., No. 102, dwell., 21' x 36'; owner, Mrs. E. A. Johnston; builder, B. A. Noble.

Colden St., Nos. 24-26, dwell., 31' 6" x 58' 8"; owner and builder, W. B. Quigley.

Brooklyn.

BUILDING PERMITS. — *Magnolia St.*, s s, 250' e Irving Ave., three-st'y frame store and dwell., lined with hemlock boards, tin roof; cost, $3,500; owner, Wm. Carpenter; architect, Mr. Taylor; builder, W. H. Nichols.

Broome St., Nos. 31-37, 4 three-st'y and basement frame (brick-filled) tenements, gravel roof; cost, $14,000; owner, F. E. Mather, 213 East Eighteenth St., New York; architect, J. Doig, Jr.; builders, Doig & Post and P. Newman.

McKibben St., n s, 510' e Bushwick Ave., one-st'y frame glass-house, gravel and shingle roof; cost, $8,500; owner, N. Dannenhoffer, Gerry St., cor. Throop Ave.; architect, Th. Engelhardt; builders, J. Wagner and E. Loerch.

Sixteenth St., s s, 73' 10" e Seventh Ave., 14 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,800; owner, architect and builder, R. Kirkman, 415½ Eighteenth St.

Halsey St., s s, 95' e Sumner Ave., two-st'y brick dwell., tin roof; cost, $5,000; owner, G. R. Waldron, 529 Halsey St.; architect, A. Hill.

Russell Pl., w s, 85' 9" s Herkimer St., 6 two-st'y brick dwells., gravel roofs, wooden cornices; cost, $3,500; owners, Felix Gallagher and John Taafe, 136 Court St.; architect and contractor, Jno. Taaffe; mason, L. A. Brown.

Putnam Ave., n e cor. Tompkins Ave., four-st'y brick store and dwell., gravel roof; cost, $15,000; owner, Paul C. Grening, 420 Gates Ave.

Putnam Ave., n s, 24' e Tompkins Ave., 9 two-and-a-half-st'y brown-stone dwells., e s, 81' 6" n Putnam Ave., two-and-a-half-st'y brown-stone dwells., all tin roofs; cost, each, $6,000; Paul C. Grening, 420 Gates Ave.

Fulton St., s s, 150' e Rochester Ave., 5 three-st'y brick stores and flats, tin roofs; cost, each, $7,000; owner and contractor, J. W. Stewart, 373 Quincy St.; architect, I. D. Reynolds.

George St., s s, 100' e Hamburg St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,200; owner and architect, A. Dillman, 87 Melrose St.; builder, H. Loeffler.

Boerum St., n s, 75' w Lorimer St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,500; owner, J. Hillenbrand, on premises; architect, J. Platte; builders, J. Auer and J. Frisse.

Rutledge St., s s, 180' w Harrison Ave., 2 three-st'y brick tenements, tin roofs; cost, each, $6,000; owner and mason, John Auer; architect, J. Platte; contractor, J. Bossert.

Central Ave., s e cor. Harman St., 2 three-st'y frame (brick-filled) stores and dwells., tin roofs; cost, each, $4,500; owners, architects and builders, Cozine & Gascoine, 109 Harman St.

Manhattan Ave., No. 142, e s, 270' s Norman Ave., four-st'y brick store and dwell., tin roof; cost, $8,100; owner, George H. Kidd, 108 Franklin St.; architect, Th. Engelhardt; builders, J. Rooney and J. Fallon.

Adams St., e s, 75' n Concord St., 3 five-st'y brick apartment-houses and stable, tin roofs; cost, $33,000; owner, E. D. Phelps, 55 Pineapple St.; architect, M. J. Morrill; builders, P. Carlin & Sons and Morris & Selover.

Quincy St., Nos. 285 *and* 287, n s, 400' e Nostrand Ave., five-st'y brick and brown-stone tenement; cost, $45,000; owner, Mary Johnson, 289 Quincy St.; architect, A. Hill; builders, C. Viny and P. F. O'Brien.

Van Brunt St., w s, on river front, 2 five-st'y brick warehouses, gravel roofs; cost, $67,000; owners, New York Warehousing Co., 57 Broadway; architect and builder, Thomas Stone.

Bedford Ave., No. 370, w s, 225' n Myrtle Ave., four-st'y frame tenement, tin roof; cost, $5,000; owner, architect and builder, A. McKnight.

Patchen Ave., n w cor. Madison St., three-st'y brick store and dwell., gravel roof; cost, $4,000; owner and contractor, J. P. Miller; architect, J. G. Glover; mason, not selected.

Jefferson St., s s, 20' w Throop Ave., 4 two-and-a-half-st'y brick dwells., tin roofs; cost, each; $5,000; owners, architects and builders, Phillips & Weild, 573 Greene Ave.

ALTERATIONS. — *Fifth Ave.*, No. 214, one-st'y brick extension, tin roof, iron cornice; cost, abt. $3,000; owner, John Devlin; architect, R. Boekien.

South Fifth St., n e cor. Third St., altered for store and flats; cost, $4,200; owner, Thomas Husson, Jamaica; architect, E. F. Gaylor; builders, M. Smith and R. B. Ferguson.

Chicago.

BUILDING PERMITS. — A. Ruess, two-st'y dwell., 3815 Johnson Pl.; cost, $3,000.

A. McIntosh, 2 two-st'y dwells., 3112-3114 South Park Ave.; cost, $10,000; architects, Wheelock & Clay.

C. H. Kaufman, two-st'y flats, 752 California Ave.; cost, $2,500; architect, C. W. Boynton.

Mrs. M. Hinsdale, two-st'y dwell., 283 Leavitt St.; cost, $3,500.

H. Holvie, two-st'y flats, 351 Thirty-sixth St.; cost, $2,800.

W. S. Edbrooke, two-st'y livery stable, 966-968 Robey St.; cost, $5,000; architect, W. S. Edbrooke.

Geo. Spohr, two-st'y store and dwell., 799 Elston Road; cost, $3,500; architect, E. Reichert.

C. P. Peterson, three-st'y dwell., 17 Wendell St.; cost, $4,600.

A. G. Sears, 2 two-st'y dwells., 33-37 Artesian Ave.; cost, $6,000; architects, Scott & Gage.

J. Cilian, three-st'y dwell., 198 Twentieth St.; cost, $3,800; architect, L. Novig.

T. Michelecky, three-st'y dwell., 447 Twentieth St.; cost, $4,600; architect, L. Novig.

J. Palt, three-st'y store and dwell., 3201 Laurel St.; cost, $6,400; architect, L. Novig.

W. Sheaf, three-st'y flats, 1030 West Harrison St.; cost, $4,500; architect, A. Bessler.

F. Albrecht, three-st'y dwell., 494 Jefferson St.; cost, $6,000; architect, J. Waska.

A. L. Crocker, four-st'y flats, 282 Indiana St.; cost, $5,000.

J. Weimand, two-st'y flats, 87 Jay St.; cost, $2,500; architect, E. Devine.

J. Voltz, four-st'y store and flats; cost, $10,000; architect, C. H. Gottig.

S. Anderson, two-st'y dwell., 515 Lasalle St.; cost, $10,000; architect, A. Cudell.

J. Long, two-st'y store and dwell., 877 Thirty-first St.; cost, $6,000; architect, P. Roehl.

Mrs. J. Schuler, three-st'y dwell., 447 Sedgwick St.; cost, $4,500; architect, G. S. Spohr.

Mrs. Baumgarten, two-st'y dwell., 461 Congress St.; cost, $3,000.

G. L. Brown, three-st'y store and dwell., 124-126 Thirty-fifth St.; cost, $11,000; architect, L. B. Dixon.

D. J. Wren, 10 cottages, Coblentz St.; cost, $10,000.

D. J. Wren, 5 cottages, Coblentz St.; cost, $5,000.

M. Gallagher, 2 two-st'y flats, 2493-2495 Cottage Grove Ave.; cost, $7,000.

E. L. Thain, 2 two-st'y dwells., 3152-3154 Prairie Ave.; cost, $10,000; architect, E. L. Thain.

G. L. Lombard, 2 two-st'y dwells., 911-913 Kedzie Ave.; cost, $5,500.

S. J. Wakeman, three-st'y dwell., 1050 West Washington St.; cost, $4,000; architect, J. Speyer.

J. H. Bentz, two-st'y flats, 352 Congress St.; cost, $4,000.

C. Nagel, two-st'y dwell., 117 Seminary Ave.; cost, $4,000; architect, J. Schnoor.

B. Quigley, three-st'y store and flats, 444 West Twelfth St.; cost, $6,000; architect, C. McAfee.

A. Williams, 2 two-st'y dwells., 292-291 Idaho St.; cost, $6,000; architect, A. Williams.

J. Waldhauser, four-st'y stores and flats, 186 North Clark St.; cost, $9,000; architect, E. Baumann.

H. Reymer, two-st'y store and dwell., 653 North Paulina St.; cost, $3,500.

S. W. Rawson, 5 cottages; cost, $4,500.

W. L. Burnham, two-st'y dwell., 456 Orchard St.; cost, $3,000; architects, Burnham & Root.

D. T. Jack, two-st'y flats, 294 Park Ave.; cost, $2,500.

W. Fallows, 3 three-st'y flats, 347-351 Washington Boulevard; cost, $30,000; architect, E. E. Snider.

Mrs. Williams, two-st'y flats, 1056 West Park St.; cost, $2,800.

J. Scannell, two-st'y flats, 722 Hinman St.; cost, $2,800.

H. S. Fitch, two-st'y barn, Michigan Ave.; cost, $3,500.

B. F. Nourse, two-st'y dwell., 3649 Grand Boulevard; cost, $6,000; architects, Wheelock & Clay.

C. Nelson, three-st'y flats, 390 Erie St.; cost, $4,000.

W. Bussell, two-st'y flats, 972-974 Walnut St.; cost, $3,000; architect, G. Isaacson.

Kansas City, Mo.

MILL. — Plans have been completed for the construction of a linseed oil mill in the east bottoms. The building will be a story brick. It is being built by Mr. James Johnson, a St. Louis capitalist.

SHOT-TOWER.—Mr. F. C. Ripley, of Dubuque, Ia., and Mr. Hugh Merril of Cincinnati are preparing to establish a shot-tower in this city.

BUILDING PERMITS. — Behney & Everett, brick business block, 13-23 East Eleventh St.; cost, $15,000.

Philip Smith, brick block, cor. Fourth and Cherry Sts.; cost, $15,000.

S. Z. Shutte, brick business house, 1207 and 1209 Grand Ave.; cost, $35,000.

W. A. Halbert, brick house on Broadway; cost, $5,000.

Mrs. C. E. Bramwell, block, 720 Troost Ave.; cost, $9,000.

L. A. Willard, business block, 901 Broadway; cost, $18,000.

V. Hansauld, frame block, Terrace St.; cost, $4,500.

J. T. Eagers, brick house, cor. Fourteenth and Tracy Sts.; cost, $5,000.

Ernest Stoltze, business block, 1415 Grand Ave.; cost, $5,000.

D. S. Long, brick business block, 1413 Grand Ave.; cost, $5,000.

W. C. Tabb, brick house, Charlotte St.; cost, $4,000.

W. H. Chick, brick house, cor. Eleventh and Brooklyn Aves.; cost, $10,000.

Minneapolis, Minn.

BUILDING PERMITS. — E. D. Jackson, two-st'y wood dwells., s s Linden Ave., bet. Sixteenth and Seventeenth Sts., n; cost, $3,000.

C. W. Lasher, alteration store-building, n e cor. Tenth Ave. and East Third St., s; cost, $3,400,

C. H. Smith, two-st'y wood dwell., s s East Nineteenth St., bet. Park and Portland Aves.; cost, $3,000.

J. C. Hallitt, three-st'y brick veneer store and flat, n e cor. Western Ave. and Ninth St.; cost, $8,000.

Swedish Mission Church Society, add. brick veneer church, n w cor. Twelfth Ave. and East Seventh St.; cost, $4,000.

S. C. Gregory, two-st'y wood dwell., Second Ave., bet. East Twenty-eighth and East Twenty-ninth Sts.; cost, $3,000.

Kenyon & Best, six-st'y brick store-building, 604 Nicollet Ave.; cost, $75,000.

New Haven.

Building Permits. — Following are the permits for new buildings issued since last report: —

Congress Ave., near Kossuth St., two-st'y frame dwell., 33' x 53'; cost, $3,000; owner, John Hegel.

College St., cor. Wall St., three-st'y stone society building, 36' x 44'; cost, $20,000; owners, Chatfield & Grant; architect, Harrison W. Lindsley.

Putnam St., near Howard Ave., three-st'y frame dwell., 2 tenements, 21' x 44'; cost, $3,000; owner, R. V. Lyon; architect, C. H. Stilson.

Railroad Ave., near Grand St., three-st'y packing-house, 73' x 82'; cost, $5,000; owners, S. E. Merwin & Son.

Olive St., near Green St., two-st'y brick dwell., 27' x 48'; cost, $5,000; owner, John R. Ruff; architect, C. H. Stilson.

Meadow St., *Nos.* 188-198, four-st'y brick and stone building, 4 stores and 12 flats, tin roof, 60' x 80'; cost, $30,000; owner, J. B. Flagg; architect, David R. Brown.

North Ave., two-st'y frame dwell., 26' x 37'; owner, F. Hartog; architect, C. H. Stilson.

Meadow St., *Nos.* 182, 184 *and* 186, four-st'y brick and stone building, 2 stores and 6 flats, tin roof, 41' x 61'; cost, $12,000; owner, Charles N. Flagg; architect, David R. Brown.

Humphrey St., cor. Wallace St., two-st'y brick building, tin roof, 22' x 40'; cost, $4,000; owner, Lawrence J. Coffey.

Munson St., 4 two-st'y frame dwells., 22' 6" x 38'; cost, $6,000; owner, E. L. Goodale.

New York.

Business in the building interests is very quiet, the monthly meeting of the Mechanics and Traders Exchange was not convened this week owing to the absence of a quorum.

Hotel Addition. — The "Buckingham" on the n e cor. Fifth Ave. and Forty-ninth St., is to have an addition built at a cost of $200,000; Messrs. C. Graham & Sons, builders.

Houses. — On the w s of New Ave., running from One Hundred and Twenty-second to One Hundred and Twenty-third Sts., 20 dwells. on ground, 75' x 201' 10" are to be built by Messrs. J. W. & A. Teets.

On the s e cor. One Hundred and Fourth St. and Manhattan Ave., 3 houses are to be built by Mr. Alex. Roux, at a cost of $45,000; from plans of Mr. R. S. Townsend.

Building Permits. — *Fourth Ave.*, e s, 70' s One Hundred and Eighth St., four-st'y brick storage building, tin roof; cost, $6,000; owner, Edward Morrissey, 236 East Twenty-seventh St.; architects, Cleverdon & Putzel.

East One Hundred and Twelfth St., *No.* 332, four-st'y brick tenement, tin roof, cost, $7,600; owner, Ratje Bunke, 319 East One Hundred and Eleventh St.; architect, H. H. Cording.

One Hundred and Thirty-first St., n s, 375' w Sixth Ave., 3 three-st'y brick (stone front) dwells., tin roofs; cost, each, $9,000; owner, S. J. Wright, 201 West One Hundred and Thirty-first St.; architects, Cleverdon & Putzel.

One Hundred and Thirty-fourth St., n s, 75' w Eighth Ave., 3 four-st'y brick tenements, tin roofs; cost, each, $15,000; owner, Walter S. Price, 232 West One Hundred and Thirty-second St.; architect, G. Robinson, Jr.

Seventh Ave., e s, 24' 11' s One Hundred and Thirty-fifth St., 3 three-st'y brick (stone front) dwells., tin roofs; cost, $27,000; owner, A. M. Tompkins, 2376 Second Ave.; architect, Andrew Spence.

Washington Ave., e s, 217' s One Hundred and Sixty-eighth St., two-st'y frame and brick dwell., cost, $3,500; owner, G. W. Bashford, 79 Cedar St., att'y for Wm. Rhinelander; architect, W. W. Gardiner; builder, John Knox.

Alterations. — *Washington Alley*, n s, abt. 50' w University Pl., on rear of Nos. 46 and 48 Clinton Pl., raised 18'; also one-st'y brick extension, tin roofs; also front and internal alterations; cost, $6,000; lessee, Edward Cooper, 12 North Washington Sq.; architect, R. Berger.

Third Ave., *No.* 2360, three-st'y brick extension, tin roof; cost, $4,000; owner, J. Q. Bourne, on premises; architect, J. Munckwitz.

Tompkins St., *No.* 43, four-st'y brick extension, tin roof, etc.; cost, $3,800; owner, Richard Hodge, 343 Rivington St.; architect, J. Munckwitz; builders, W. Nolan and W. McDevitt.

Fiftieth St., n s, abt. 197' e Seventh Ave., raised one-st'y; cost, $5,000; owners, Broadway & Seventh Ave. R. R. Co.; architect, S. D. Hatch; builders, R. L. Darragh & Co. and J. Elgar.

East Thirty-sixth St., *No.* 13, two-st'y brick extension; cost, $5,000; owner, Henry C. Valentine, on premises; architect, E. E. Raht; builders, D. Campbell and Germond & Co.

Fifth Ave., n e cor. Forty-third St., internal alteration; cost, $3,000; owner, Temple Emanuel; architect, W. H. Hume; builders, I. A. Hopper and J. Elgar.

West Thirty-ninth St., *No.* 205, five-st'y brick extension; cost, $60,000; owner, St. Vincent de Paul Orphan Asylum, on premises; architect, W. H. Hume.

West Forty-third St., *Nos.* 542 and 544, three-st'y brick extension for stable; cost, $3,000; owner, Thos. J. King, on premises; architect, W. F. Simonds.

Fifth Ave., *No.* 421, two-st'y brick extension, tin roof; cost, abt. $8,000; owner, Catherine M. Van Auken, on premises; architect, G. B. Post.

Philadelphia.

Building Permits. — *Dupont St.*, e Ridge Ave., two-st'y dwell., 16' x 42'; H. Lovering, owner.

Ridge Ave., cor. Johnson St., 4 two-st'y dwells., 12' 6" x 30'; J. C. Hains, contractor.

Vienna St., s e cor. Memphis St., stone basement to church, 60' x 113'; Thos. McCarty.

Twenty-seventh St., n Columbia Ave., two-st'y brick stable; O. McKenna, owner.

Viola St., n Fairmount Ave., 2 two-st'y dwells., 12' 6" x 26'; J. F. Wimser, contractor.

Mascher St., n Norris St., two-st'y dwell., 16' x 30'; B. Jacobs, owner.

Tucker St., n Memphis St., two-st'y stable, 16' x 34'; F. R. Clark, owner.

Queen St., n Township Line, two-st'y stable, 18' x 30'; C. E. Bartle, contractor.

Arch St., *No.* 1303, two-st'y back building, 14' x 36'; Kester & Oram, contractors.

Vankirk St., n Jackson St., two-st'y dwell., 16' x 33'; T. B. Long, owner.

Twenty-seventh St., n Dauphin St., three-st'y dwell., 19' x 30'; Aug. Schriber, contractor.

Frankford Ave., cor. Emerald St., two-st'y dwell., 16' x 48'; C. H. Maisland, contractor.

Otsego St., *No.* 1814, two-st'y stable, 16' x 35'; Peter Stuebling, contractor.

Forty-ninth St., s Chestnut St., 7 two-st'y dwells., 14' x 28'; W. Bunch, contractor.

Fifteenth St., s Dauphin St., 2 two-st'y dwells., 17' x 55'; C. C. Moore, contractor.

Eleventh Ave., n e cor. Lehigh Ave., addition, 16' x 36'; Chas. Stirling, Jr., contractor.

Warren St., w Fortieth St., 3 two-st'y dwells., 11' x 40'; Geo. Heiser, contractor.

Garibaldi St., w Tenth St., two-st'y stable, 20' 6" x 73' 4"; F. Shillinger, contractor.

Bainbridge St., w Eighteenth St., 6 two-st'y dwells.; Jos. Bird, contractor.

South Second St., *No.* 1517, 3 two-st'y dwells.; Dunbar & Myers, contractors.

Second St., n Diamond St., 6 three-st'y dwells.; Alexander J. Richards, contractor.

Lambert St., n Diamond St., two-st'y dwell., 15' x 45'; J. Richtly, contractor.

North Third St., *No.* 1128, two-st'y dwell., 18' x 69'; Jno. Klebe, contractor.

St. Louis.

Building Permits. — Eighty permits have been issued since our last report, twelve of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

A. Mansur, two-st'y brick dwell.; cost, $25,000; Peabody & Stearns, architects; J. D. Fitzgibbons, contractor.

C. H. Blankmuster, two-st'y brick dwell.; cost, $3,000; Chas. May, architect; L. Yaeger, contractor.

H. Woeltge, two-st'y brick tenement; cost, $5,000; L. Yaeger, contractor.

Chas. Schroeder, two-st'y brick dwell.; cost, $3,300; Whri, architect; Wm. Riewe, contractor.

E. O. Standard, two-st'y brick dwell.; cost, $7,000; A. Beinke & Co., architects; sub-let.

John Padberg, two-st'y brick dwell.; cost, $3,000; J. R. Bolfes, contractor.

J. B. Powell, 2 adjacent two-st'y brick dwells.; cost, $5,800; Fred. Hoffermann, contractor.

F. Heimenz, one-and-one-half-st'y brick dwell.; cost, $2,750; Jos. Handen, contractor.

F. W. Meier, two-st'y brick dwell. and stable; cost, $2,900; Henry W. Rocklage, contractor.

Robert Kreplin, two-st'y brick store and dwell.; cost, $2,600; A. Beinke & Co., architects; L. Yaeger, contractor.

St. Louis Illuminating Co., one-st'y Electric Works; cost, $5,000; Taylor, architect; Kirgin & Bro., contractors.

D. C. O'Shea, 2 adjacent two-st'y brick tenements; cost, $3,000; T. Murphy, contractor.

St. Peters Episcopal Church, one-st'y brick addition; cost, $6,800; Gravel & Co., architects; R. P. McClure, contractors.

Wm. C. Lange two-st'y brick dwell.; cost, $3,500; A. C. Janssen, architect; C. Linnen Kohl & Co., contractors.

Oliver Von Schrader, four-st'y brick store; cost, $8,000; I. Taylor, architect; F. C. Bousack, contractor.

Wm. Brenneke, 3 adjacent two-st'y brick tenements; cost, $4,000; O. Doemer & Bro., contractors.

Mr. De Jeannette, 3 adjacent two-st'y brick tenements; cost, $3,700; C. C. Helmers, architect; John R. Davis, contractor.

Mary J. Switzer, four-st'y brick store; cost, $13,000; E. Mortimer, architect; D. Evans, contractor.

Henry Bodicaker, 2 adjacent two-st'y brick tenements; cost, $3,500; J. Goesse, architect; Bothe & Ratemann, contractors.

Frost & Clemence, two-st'y brick stable; cost, $4,000; J. Johnson, architect; J. A. Stanton, contractor.

W. L. C. Bray, two-st'y brick dwell.; cost, $3,600; Thos. J. Furlong, architect; James H. Keefe, contractor.

Mrs. Nora Murphy, two-st'y brick dwell.; cost, $2,700; J. B. Lindsley & Son, contractors.

John Dorrer, two-st'y brick dwell.; cost, $4,500; Thomas Roach, contractor.

Z. Berry, two-st'y brick dwell.; cost, $3,700; E. D. Ogden, contractor.

Patrick Shea, two-st'y brick dwell.; cost, $3,300; J. J. Wharton, contractor.

G. H. Timmermann, four-st'y brick store; cost, $15,000; Klute & Hildebrandt, contractors.

John Callaghan, 2 adjacent two-st'y brick dwells.; cost, $3,000; F. H. Goss, contractor.

F. Müeller, 2 adjacent two-st'y brick dwells.; cost, $4,300; F. Müeller, contractor.

J. J. Ledus, two-st'y brick dwell.; cost, $6,500, Grable & Co., architects; B. F. Stotlemeyer, contractor.

St. Paul.

Building Permits. — Four-st'y brick business block, w s Robert St., bet. Sixth and Seventh Sts.; cost, $19,000; owners, St. Paul Real Estate and Improvement Co.

Two-st'y brick veneer dwell., s s Grant St., bet. University and Aurora Ave.; cost, $6,000; owner, Lewis L. May.

Alteration five-st'y brick army offices, e s Robert St., bet. Second and Third Sts.; cost, $10,000; owner, U. S. Government.

Three-st'y brick stores and dwells., s s Dakota Ave., bet. Chicago and Indiana Aves.; cost, $14,000; owner, C. F. Meyer.

Brick church, s w s Sixth St., bet. Franklin and Exchange Sts.; cost, $35,000; address, Rev. A. J. D. Haupt.

Two-st'y frame dwell., w s Wilkin St., bet. McBoal and Mississippi River; cost, $4,000; owner, C. E. D. Olmstead.

Two st'y brick veneer dwell., n w s Summit Ave., bet. Selby and Nina Aves.; cost, $10,000; owner, J. S. Robertson.

Two-st'y frame dwell., n s Pleasant Ave., bet. Third and Ramsey Sts.; cost, $4,000; owner, Mrs. E. S. Hall.

Bids and Contracts.

Dover, N. H. — The Dover Improvement Association have awarded the contract for building the new shoe factory to Hiram F. Snow, for $21,800.

Washington, D. C. — The following is an abstract of the bids for iron-work of library of State, War and Navy Building: —

Builders' Iron Foundry, Providence, R. I., $43,250.
Snead & Co. Iron Works, Louisville, Ky. (*accepted*), $26,840.
Jackson Architectural Iron Works, New York City, $46,750.
Phœnix Iron Company, Trenton, N. J., $49,000.
Hecla Bronze & Iron Company, Brooklyn, N. Y., $45,650.
Manly & Cooper Manufacturing Company, Philadelphia, Pa., $54,321.

Bids were opened at Colonel Casey's office for the erection of a fire-proof building for the Army Medical Museum. The following were the bidders and total amounts bid, including those for heating apparatus: —

D. C. Weeks & Son, New York, $233,637.
Frank Baldwin, Washington, $185,490.
Bright & Humphrey, Washington, $179,987.
August Getz & Co., Washington, $194,000.
M. A. McGowan, Washington, $182,540.17.
C. A. Schneider & Sons, Washington, $198,405.33.
D. J. McCartney & Co., Washington, $200,595.
J. F. McDermott, Washington, $191,600.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. No. 507.

SEPTEMBER 12, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE Royal Institute of British Architects, the largest and most influential body in the profession, has now under consideration a change in its charter, by which it is to be made possible for members who cannot attend the meetings in London to vote on questions in which they may be interested "by means of voting papers transmissible by post." The Royal Institute has often been accused of excessive conservatism, but, although it moves slowly, it is certainly managed with great ability, and nearly every year brings with it some change in the by-laws, or some movement among the members, sanctioned and encouraged by the government of the Institute, which is destined to exert a great and lasting influence over the future of architects in all parts of the world. It is only about two years, for instance, since the rule requiring all candidates for admission as Associates of the Institute to pass an examination was, after many months of discussion, finally adopted, but the effect of the strict enforcement of the rule is, we think, already visible in a somewhat more considerate treatment of the profession by those outside of it, as shown in many instances, and still more in the calmer and more rational tone in which topics of professional importance are discussed in the technical journals. There is no surer sign of conscious weakness than intemperate language or action, and the disappearance from the English papers of those complaints and recrim[illegible] particularly in regard to competitions, which [illegible] common, gives evidence of the improved standing of the profession in Great Britain, and the more secure prosperity of its members, which have resulted, partly from the elevation of the principal professional association to the rank of a learned body, requiring definite qualifications for admission; and partly from the movement of resistance to the abuses of public competition which was one of the first tasks to which the reinvigorated Institute put its new-found strength. The improvements in methods of management at present contemplated follow naturally from those already accomplished. The Institute now deals with matters of greater professional interest, and acts upon them with greater authority, than ever before, and the desire of the provincial members to be enabled to take part in the proceedings is, we venture to say, no stronger than the wish of their leaders to secure, in just this way, that widespread sympathy with their plans, and support of their policy, which will enable them to advance still more rapidly and certainly in the elevation of the profession for which they have already done so much.

THE *Builder* gives some interesting particulars of the life of the late Professor Donaldson, a man whose enthusiastic activity in his profession won for him well-deserved honors in nearly every part of Europe. His father, an architect, and district surveyor in London, was of rather distinguished descent, and seems to have been a clever and judicious man. He sent his son to one of the public schools, at St. Albans, where he remained until he was fourteen years old, and was then sent out to the Cape of Good Hope, to begin a mercantile life in the house of Mr. Robert Stuart, one of the principal merchants of South Africa. Soon after his arrival there, an expedition was fitted out to attack the French colony of Mauritius, and young Donaldson volunteered to accompany it. After effecting a landing, the expedition made ready for an assault upon the fort, and Donaldson, although hardly more than a child, was selected as one of the "forlorn hope" to make the first attack. Fortunately for the profession of architecture, the French, seeing the preparations, concluded not to wait for the assault, but made terms for surrendering, and Donaldson returned to the Cape unhurt. He had hoped to obtain a commission in the regiment in which he had volunteered, but his youth was probably against him, and he returned, disappointed, to England, where, at the age of sixteen, he began the study of architecture with his father. He was encouraged, as all young architects should be, to practise himself in purely artistic work, and carried off in 1817 the silver medal of the Antique School at the Royal Academy, a signal honor for a student who expected to be neither a painter nor a sculptor. After this, as our readers know, he spent several years in travelling, sketching and writing, and, while in Rome, living with the French students at the Villa Medici, amused himself by designing a temple of Victory, which was shown to Canova, and won for its author an election to membership in the Academy of St. Luke, of which Canova was then President. His subsequent life was not extremely eventful, but his energetic character showed itself in nearly everything that he did, and his death at the age of ninety, although he had many years before given up active work, was felt as an irreparable loss to the profession.

IT would be hard to find anywhere a pleasanter little city than Havre, the principal port on the Norman coast of France, and it seems, from an account given in *La Nature*, that this pretty town is also fortunate in the possession of a public-spirited set of men, who have recently carried out with great success a plan for the amelioration of the dwellings of their poorer fellow-citizens. The Mayor of the city, M. Siegfried, with M. Mallet, the President of the Chamber of Commerce, and Dr. Gibert, who seem to have been most active in the matter, observing, as others have done, that the poorest people pay a higher rent for their tenements, in proportion to the accommodation which they get, than those of a more affluent class, inquired into the reasons for this apparent injustice, and learned, what any tenement-house agent might have told them, that, owing partly to the lack, among many of those who occupy the cheapest rooms, of any personal property which can be attached as security for the payment of the rent, and partly to the disproportionate cost of the legal proceedings necessary to get rid of a dilatory tenant, many losses occur in the management of this class of property which are avoided in the case of better rooms, rented to people who have something to lose, and would rather pay their rent honestly than have their goods seized by the sheriff; so that it is necessary to add to the normal rental of the smallest tenements a percentage large enough to make up for the inevitable losses by the small frauds of irresponsible persons.

THERE is no legal maxim more frequently confirmed in the courts than the proposition that all the terrors of the law cannot make a man pay his debts if he has nothing to pay them with; and the good citizens of Havre, finding the inevitable corollary of this to be that if a man does not pay his debts himself, some one else, whether willingly or unwillingly, has to pay them for him, applied themselves to the preparation of a scheme by which the poorest tenant, not absolutely a pauper, should be encouraged to obtain, in as brief a time as possible, a small property, the possession of which would afford security for the payment of his debts, and would thus enable him to enjoy those reductions in rates of rent and household expenses that constitute one of the privileges of honesty and financial solvency. It is needless to say that their solution of the problem was essentially the same that has already been discovered in England and elsewhere, consisting in the sale of dwellings to poor tenants by instalments extending over a long series of years; but the details of the Havre scheme differ a little from the usual plan. The first step was to form an incorporated company, with a capital of forty thousand dollars,

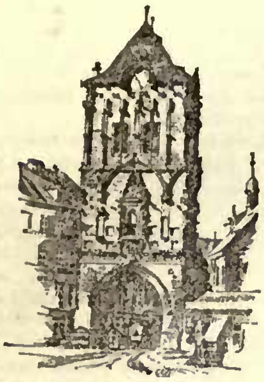
to which the city added five thousand as a gift. A rule was adopted to the effect that four per cent interest on the investments of the company should be the maximum demanded or expected, and the directors proceeded to begin building operations on this basis. A quantity of land was procured, and divided into lots varying in area from one thousand to thirteen hundred square feet; and houses were built, each being about sixteen by twenty feet in plan, outside the walls, and two stories high. The entrance story was divided into two rooms, one fourteen and one-half feet by eleven feet, and the other seven feet by eight and one-half feet, the stairs and hallway occupying the remaining space. The second story was divided in the same way. A garden was left behind each house containing five or six hundred square feet of ground, and a yard in front of about half this size. This was not, it is true, a very extensive establishment, but it was large enough to shelter a good-sized family comfortably and decently, and to accommodate an immense amount of domestic virtue and happiness; and the whole affair, ready for occupancy, cost less than six hundred dollars, including the price of the land. The houses were built in pairs, for the sake of economy, and were rented for sixty dollars a year, with the agreement that the tenant who paid his rent regularly for fifteen years should become the absolute owner of his house. The rent was nominally divided into two portions, forty-two dollars being regarded as rent simply, and the remaining eighteen as a sinking-fund payment, and it was provided that in case any tenant should wish to give up his house, or should fail to pay his rent, the amount of his contributions to the sinking-fund should be returned to him, with interest at three per cent, after deducting the expenses incident to the change of tenants. In this way the company was sure of its money, since each tenant always had a sum on deposit sufficient to cover any loss likely to occur under good management, and it could afford to give its tenants the advantage of the lowest rates of interest. In case a tenant wished to anticipate his payments he was encouraged to do so by an allowance of five per cent interest on all sums paid before they were due. When matters of this kind are clearly explained to them, workingmen, even of the poorest class, are often as intelligent in trying to save a few cents of interest as any millionaire bank-president could be, and at Havre the amount of anticipated payments has been so great that although the company was only incorporated in 1871, fifty-six, out of one hundred and seventeen houses which it has built, have already become the property of their tenants, and about twenty more will very soon be finally transferred.

A NOVEL scheme is proposed in a supplementary sheet sent out with the last number of *Le Génie Civil*, for raising the money needed for the great Paris Exposition of 1889, without calling either upon the Government, the city of Paris, or the hotel proprietors and railway companies. This scheme, which is put forward by M. Berger, consists mainly of the issuing of invitations to all persons to become stockholders in the exhibition, and the division of the capital necessary, which is calculated at ten million dollars, into ten million shares, of the value of one dollar each. Payment for the shares might be made either at once, or by five annual instalments, of twenty cents each; and the possession of a certificate of stock would entitle the holder to a discount of ten cents from the price of admission whenever he went to the exhibition, as well as to such discount from the regular rates of fare as the railway companies would probably find it for their advantage to allow to stockholders at a distance; and at the end of the exhibition the whole amount received from entrance fees and other sources would be divided by lot, in prizes of varying amount, among the stockholders. Although the number of subscribers necessary, according to this plan, would be equal to one-fourth of the population of France, M. Berger believes that the money could be raised. The large manufacturers, merchants and other persons, who have usually been called upon to make large subscriptions to the guarantee fund for such occasions, would, he thinks, be much more disposed to subscribe at once for five hundred or a thousand shares, at a dollar each, which they could please their workmen by distributing among them, than to send their certified checks for five or six thousand dollars to the treasurer of the guarantee fund, to lie idle in his custody for two or three years, losing interest, even if the fund should not, after all, be called upon; while the finances of the Exhibition would gain, not only by the direct contribution of a sum quite as large, probably, as the same subscriber would in any case be held to pay under his guarantee, but by the distribution of so many certificates among persons who would not otherwise have been interested in the affair. As M. Berger remarks, it is well known that people who have complimentary tickets to the theatre given them often spend more than the cost of an ordinary ticket to avail themselves of their privilege; and he thinks that the ten million stockholders will make exertions to get to the Exhibition, and enjoy the benefit of their discounts, which they would not have thought of under ordinary circumstances. It is proposed further, as an offset to the enormous number of free admissions which are necessarily granted to exhibitors and their agents or salesmen, that all exhibitors shall be required to subscribe to the capital, to the amount of one share for themselves, and for each of their representatives and agents in the Exhibition. As the possession of stock, although it offers them no privileges in regard to admission which they would not enjoy under the ordinary management, carries with it the right to participate in the final distribution of profits, few exhibitors would object to subscribing the small sums required, and the gain to the resources of the enterprise would be very important. The final lottery for the benefit of the shareholders is, as M. Berger says, the most objectionable part of the plan, but he considers that a fair equivalent is, without it, given to those who buy shares, so that the worst element of gambling is removed; and as it is necessary, not only to secure money enough beforehand to pay the cost of the Exhibition, but to return the profits to those who have furnished the capital, it is, he thinks, most judicious to choose a mode of doing so which will attract some persons who would be too selfish to contribute otherwise, while those who are satisfied with what they have already received for their subscription, can, if a prize should fall to them, use it for some benevolent purpose.

THE number of professional associations is increasing so rapidly in this country, that there must be among our readers a considerable number of society officials and committeemen who will be glad of such suggestions for conducting general reunions as can be obtained from descriptions of those held in other places. The last one of which we have received the programme is that of the Swiss Society of Engineers and Architects, which holds its annual meeting this year, by invitation of the local association, at Lausanne, on the border of the Lake of Geneva. Lausanne, it will remembered, was the favorite resort of Viollet-le-Duc, who spent his summers there for many years, and offers many attractions in the way of modern as well as ancient architecture, most of which seem to have been considered in the programme of the meeting. The first event on the list is the assembling of the delegates at the Hôtel de Ville, at four o'clock in tho afternoon of Thursday, September 10. Here tickets are distributed for the fêtes of the succeeding days, and the delegates then disperse to their rooms and their dinner, to meet again at seven o'clock at a reception in the club-house of the Beau-Séjour. The next morning, at eight o'clock, a business meeting is held at the Casino Theatre near the Club-house, and papers are read and discussed; and at half past twelve lunch is served in the theatre. The afternoon is devoted to drives about the city, with visits to the Cathedral, hospitals, schools, railroad stations and so on; aud at eight in evening is an out-door concert and reception. The next morning, at a quarter past eight, a steamboat leaves the port, a mile and a half from the town, for Evian, on the other side of the lake, where an interesting mountain railway is inspected, and the company then proceeds to the upper end of the lake, where a curious pneumatic railroad has just been built, and the boat reaches home at last, after touching at various interesting points on the way, at half-past seven in the evening. Half an hour later comes the dinner which closes the festivities of the meeting, and at midnight a special train is ready to take passengers to Berne, the central point of the Swiss railway system, from which all parts of the country are soon reached.

WE hope to find during the coming week that the draft which we made on the profession, when we suggested designs for Memorials to General Grant should be sent to us, has been honored in the spirit in which it was made; and we trust that the general result will be as satisfactory as the the designs already received leads us to believe it will be.

PRAGUE.—I.



Powder Tower, Prague.

ALEXANDER HUMBOLDT, first and greatest of "globe-trotters," is often quoted as having called Prague the most beautiful inland city he had ever seen. If the quotation is not authentic it is certainly *ben trovato.* Without rivalling Humboldt, I have seen many cities in many lands, yet but very few — whether inland or sea-girt—which are worthy even to be compared with Prague for beauty. Its charm is half natural, half architectural; and the two factors harmonize and enhance one another so admirably that it seems as though Nature had worked with a prophetic eye upon the artist, and the artist always with a grateful care for her.

The city lies on both sides of the Moldau — a wide and vigorous stream dotted with wooded islets — where it makes a right-angled turn, and flows east for awhile after having flowed due north. On the right bank, in the elbow of the stream, and set about with an amphitheatre of hills, lie the Alt-Stadt and the Neu-Stadt, once separate quarters divided by a wall, but now blending together and appearing of quite equal antiquity. At the extremity of the Neu-Stadt — that is, at the up-stream extremity of the town — rises the hill called Wyscherad, where the first founders of the town established themselves at least as early as the ninth century. Here in 874 was built Prague's first Christian church, the second in all Bohemia.

The left bank of the river called the "*Klein-Seite*" offers but little level ground, but none the less a wide-spreading quarter exists here as well, and all the more is it picturesquely delightful. A mass of narrow winding streets and irregular open squares fills in the space between the steep hills, and stretches valiantly up the most northerly and steepest, the Hradschin, which is the crown and pinnacle of Prague. It is a long, narrow promonotory rather than a hill, as we see when we reach the top and find how widely to the westward stretch its streets and palaces and gardens; but the sides fronting the river are very abrupt, and on the bold extremity stands the royal *burg;* an immense aggregate of fortifications, palaces and churches, with the broken, unfinished but most effective mass of the cathedral towering over all. Here, at the down-stream extremity, was the second settlement made in Prague, the city, as we might guess, having crept downwards to the low grounds from beneath the protecting shelter of its two early castles. There are many magnificent points of outlook in Prague, but the finest of all is from the Hradschin. Immediately beneath our feet the steep hillside is dotted with palaces and covered with gardens. The middle distance far below is a long reach of the most diverse and effectively grouped towers, and spires, and domes and turrets, with the river curling through them, spanned by its many bridges. And the background everywhere on both sides of the stream is formed by forest-covered heights of the most enchanting outlines. As far as the eye can reach up-stream the city extends, the Wyscherad hill being barely visible in the distance. And as far as it can reach in the opposite direction is a beautiful rolling country sprinkled with spires and villages. It is more than a beautiful view; it is a vast and magnificent panorama, as varied as it is harmonious. To see it in winter would still be a privilege; but in winter one would not really see *Prague;* for I say, Nature's handiwork is at least as important a factor in her peculiar charm as is the handiwork of man.



The Thein Kirche, Prague.

As for this last, it is very interesting in many individual monuments, but still more interesting considered as a whole; looked at simply as an ever-changing picture where the elements of many ages mingle together in a curiously felicitous manner. There is no architectural lion of the first class to be noted, but all the specimens in the brilliant show do but roar the more effectively in consequence. No one thing kills another, and no one period seems so especially characteristic, that we are inclined to depreciate others in its favor.

The greater part of the many Romanesque buildings which once existed have naturally disappeared, but some small and simple yet interesting monuments remain. There is a great deal of Gothic of many kinds and periods and qualities; there is at least one early Renaissance structure, which for purity and true Italianism of accent has few rivals north of the Alps; and there is later Renaissance in abundance, and Baroque without end. Often the Baroque work is very good of its kind, and even when it is not so good it does not distress us as it does in most other places. For the truth is that Prague does not put us in a very serious architectural mood. It is so supremely entertaining that we are content simply to be entertained; do not ask to be instructed or inspired. We are perpetually delighted, but we do not so much admire upon our conscience as cast critical responsibility to the wind and light-mindedly applaud. If for a moment we are touched to greater seriousness, at the turning of the first street-corner we relapse into our careless optical pleasure-seeking. Picturesqueness is the order of the day, motley is the only wear in the Bohemian capital. If an object is picturesque; brings an unexpected or a "telling" note into the harmonious medley, we forget to ask for more. And the mass of Baroque which mingles with more thoroughly respectable factors in the brilliant pageant, plays its role to the entire satisfaction of our superficial mood. All of which is to say that not the architect so much as the painter — and the water-color painter at that—finds his ideal in Prague. Such an one might work there for months—nay, years—without exhausting its fascinations, to which the colored plaster of the last two centuries certainly contributes in a noteworthy way. I remember in especial one pale green Rococo building in the Neu-Stadt as being weak enough architecturally, but quite enchanting from an aquarellist's point of view. (With the usual naïve anachronism of the popular mouth one is told that it was formerly the abode of Doctor Faustus. Now it is a deaf-and-dumb asylum). And I remember also, up on the hills behind the Hradschin, the Strahow Convent where we were taken to see many things we did not want to see, but where we were repaid for our disappointment by a glimpse of the cloisters; a double quadrangle enclosed not by arcades, but by low solid walls pierced with small square Baroque openings. Architecturally, once more, it was naught; but pictorially the deep yellow of its stucco, and the wild-growing shrubbery, and the strong shadows beyond the openings; yes, and even the scrolling lintels and jambs themselves — and the jolly monk in the foreground with his round face like the sun on the dial-plate of a colonial clock — pictorially, I say, it was worthy of some "Spanish-Roman" painter's art.

One can only see Prague by spending all one's money on cab-drivers. For the points of view which must be taken to appreciate the vast panorama in its entirety, and also the chief objects of interest, are widely scattered; and the distances are enormous to say nothing of their being chiefly up-and-down hill. But, one of the many proofs that in going from Saxony into Bohemia one goes from the north to the south, the drivers are of the race of Jehu, and the local entertainment gains an added touch of exhilaration for which one gladly pays.

The historic interest of Prague is as great, and also as varied and as picturesque, as its architectural interest. It is a serious story enough if understandingly pondered. But to the average ignorance of the casual tourist it does not seem serious so much as brilliant, and again, entertaining in quality. It is very dim and misty in its earlier portions; and the barbaric Bohemian names which mark the chronicle sound as fantastic and unreal as the nomenclature of some remote mythology. Even when we get down to firmer foundations, and think of the great religious wars which here had their centre for hundreds of years, even then, I fear, our knowledge is likely to be but superficial. Who Ziska was and Huss and Jerome of Prague and Wallenstein we know, and what were Protestants and Catholics. But this is by no means enough of a clue to make plain the mazy tales of local leaders and of endless warring sects and quarreling congregations and brotherhoods (ironic term) which form the staple of Prague's wild record. But at the moment one hardly

regrets his ignorance; the whole thing seems like a legend invented for pure picturesqueness, and gains in "tone" what it lacks in definiteness of contour. One does not care to pry into details each of which has its bloody and revolting, if often, too, its heroic side; or to be asked to pronounce in retrospect between parties each and all of which upon nearer acquaintance seem ferocious and detestable. At home in one's prosaic study, I should say, is the place to bend one's mind upon the history of the Reformation with its Hussite preface, and its ultra-Catholic sequel. Then one will surely rejoice to have Prague's picture in the background of one's memory. But on the spot — well, he must be a serious-minded man indeed who during a brief stay can find time to do aught else than use his eyes for their sensuous delighting. I will but add that the merest smattering of local history (which will include, of course, the familiar tale of the great Frederic and his terrible bombardment), causes us to wonder, not that desecration and destruction, fire and sword and iconoclastic rage, should have left their myriad traces, but that one stone of mediæval Prague should to-day remain upon another. And, too, when we remember that Prague was the earliest stronghold of Protestantism in Germany, was the great centre of would-be reform a century before Luther's birth and carried on the struggle with unrivalled energy for a century beyond his death; and when we then note that its modern character is so pronouncedly Catholic as to seem quite exotic north of the Alps, we learn that the blood of the martyrs is not always, locally speaking, the seed of the church. At the battle of the White Mountain in 1621 Wallenstein so wiped out the valiant Protestantism of Bohemia that there are to-day but three thousand Protestants among the two hundred and fifty thousand residents of Prague. Looking back from an impartially architectural standpoint, however, one cannot persuade one's self to sympathize very strongly with the reformers. For they were even more destructive to art in fact than they were to Romish doctrines in intent; and the worst of their ravages were wrought when, the common enemy having been banished for a season, they found leisure to war among themselves.

Our inn (called by the mediæval-sounding name of the "Blue Star," but hopelessly modern in all besides), looked out directly on the "Powder Tower." Built in the middle of the fifteenth century, it is now the only relic of the former Alt-Stadt wall. When I saw it first, some years ago, it was but a relic of itself, as our illustration shows; but it was more attractive in that condition than to-day, when it has just been "restored" into a very different shape as well as surface. All the sculptures of the fronts have been renewed — it is but fair to say with scrupulous care for every tiniest item of ancient handiwork; but these items were so few that the general effect is very spick-and-span, and while the decorative detail is fairly well done, the figure sculpture is quite down to the restorer's average. But one might possibly forgive this if the little inappropriate but quaint and undisturbing eighteenth-century cap of red tiles had not been replaced by a heavy panelled balustrade, and an immensely tall slated roof of the saddle-back pattern. A roof of similar kind may have crowned the tower in its original estate, but doubtless it was not of similar outlines and proportions.

Passing under the tower a narrow street leads us ere long to the *Grosser Ring* or market-place of the Alt-Stadt. One side is shared between a Baroque palace and the Gothic Thein (or Teyn) Kirche which rises to an immense apparent height over the low arcaded houses which conceal its base. Opposite the church on a corner stands the Rath-Haus, which is now chiefly pseudo-Gothic of about forty years' antiquity, but which still retains the body of its ancient tower, with a curious sixteenth-century clock of dramatic performance; a very late and fantastic Gothic doorway with a couple of neighboring windows; and an exquisite polygonal oriel with a lofty tapering roof. This oriel dates from the middle of the fourteenth century, and has special interest apart from its matchless grace and lightness of design, for it was and still is—or rather, now is again—not a mere window but the apse of a small chapel in the second story of the building. Of the interior of the old Rath-Haus little survives save this chapel and a great council-chamber, I believe the latter is very well preserved, with a great deal of carved and painted panelling and a fine wooden ceiling, the great beams of which are curiously supported to the eye by gilded chains; but the sight of it was the sacrifice I made to the goddess of lost opportunities. (One never leaves any place, I find, without making some such sacrifice and usually at the prompting of the same silent priest — forgetfulness).

With the Rath-Haus and the *Grosser Ring* we are in the very heart of Prague as the great religious struggles knew it. To name but a couple of characteristic items: below the oriel-apse was built out the scaffold where a batch of noble rebels were beheaded by order of Ferdinand II in 1621; and in the market-place fell the heads of those officers whom Wallenstein branded as cowards after the battle of Lützen in 1633.

Continuing our stroll we pass under the walls of a great aggregate of late Renaissance, of Baroque and Barocicised buildings known as the *Clementinum*, once a very famous and still a less famous Jesuit seminary. Then we come to the open *Platz* which forms the vestibule, so to say, of the chief and oldest bridge. This is named the Carls-Brücke after its creator Charles the Fourth, who in the fourteenth century founded the famous University of Prague, and bestirred himself in a mighty manner for the profit and adornment of the town. As he is the great local lay saint we cannot but wish that a fine station near the bridge was occupied by a better statue in his honor than the one set up a few years ago by the Dresden sculptor, Hänel. (I may say in parenthesis that the modern statues of Prague are rather worse, while decidedly more ambitious than those in most other trans-Rhenish towns. I have rarely seen the equal, for instance, of the Radetszy Monument with its enormous bronze figure of the great marshal posturing on top of something, which, we are told, is a shield and which is upheld, as we also know from hearsay only, by eight soldiers who posture on the ground).

The Alt-Stadt end of the bridge is defended by a huge tower, similar in design to the "Powder Tower," but earlier in date. At the farther, *Klein-Seite* end is another of analogous design, and a second which is still earlier, is smaller, and unlike its fellows has not yet been "restored." But it would have been a very vandal of a restorer who could much have injured the general effect of these great portals with the beautiful wide sweep of the long bridge between. The finishing touch of picturesqueness was given by the art of the last century in the shape of the colossal statues of saints which range themselves on either balustrade; a most vivacious, entertaining and decorative, if sculpturally reprehensible Rococo company. Yet even sculpturally they do not seem so reprehensible after all when compared with the one or two moderns who intrude among them. They are at least alive and full of character in their affectation and exaggeration, alive and most amusing; while the moderns are dead in their dull decency; depressing and doleful beyond the power of words.


Alt-Stadt End of Bridge, Prague.

On the bridge we may pause if we will — and of course we will if we have any soul for local color—to note the slab which marks the spot whence the great saint of Bohemia, St. John Nepomuc, was cast into the river in 1383 because he refused to tell the Emperor Wenzel all the Empress's private secrets as revealed in the confessional. His body floated in the Moldau for many days with five bright stars hovering above it, and he is now pictured and carven, stars and all, in every corner of the town. In one place above the bridge-balustrade he is carven in stone while the stars stand out about him in the guise of five great red gas-lamps; a bit of color which we may call widely modern rather than narrowly local. We are better pleased with a neighboring crucifix of enormous size that was paid for by fines exacted from Jews who had reviled the cross. It convinces us that the ancient Prague-ites had a feeling for the morally as well as for the materially picturesque.

We can note such details as these, however, only after we have sated our eyes with the superb view the bridge affords. The river whirls under the wide well-planted arches amid its green islands and at the feet of quaint time-worn houses. Both its banks, with the great bridge-towers as foreground features, offer a marvellous medley of conspicuous forms, the green copper domes of sundry Baroque churches giving the strongest note of color. And on the *Klein-Seite* bank which we are approaching rise in the near background the lofty Lorenz-Berg clothed to its top with forest, and the still loftier Hradschin clothed with man's handiwork, and surmounted by its fourteenth-century cathedral. So huge does the bulk of this appear, that we hardly realize at first what a fragment it is — merely a great choir with a polygonal end, a great square tower (capped with an odd Rococo finish of several diminishing stages), and a bit of transept end between, with its naked window arch showing like a bridge against the sky; but it is superb as a fragment, and the grouping changes into new effectiveness with every step we take. We cannot but regret that the body of the church is now being built and that, therefore, Prague's cathedral will ere long lose its individuality, and be but one among others. It seems almost too much to hope that it will not lose all its beauty too, that the general effect of the Hradschin will not suffer with it, and with this the general effect of Prague's matchless panorama. M. G. van Rensselaer.

A Powerful Pulley. — A pulley thirty-four feet in diameter and weighing eighty-three tons has just been made in England. It has grooves for thirty-two ropes, which, together, will transmit 1280-horse-power, and the rim will have a velocity of more than a mile in a minute. —*Philadelphia Press.*

CLOCKS IN RELATION TO ARCHITECTURE.[1]



ALTHOUGH turret-clocks cannot be said to belong to architecture, yet their association therewith is so intimate, that some jottings on the subject from a practical standpoint may not be out of place in a journal devoted to architectural interests.

No tower, whether of church, town-hall, or other public building, can be considered complete without a suitable clock, for passers-by almost instinctively look up to see the time, and are naturally disappointed if there is no clock to show it. Indeed, the *raison d'être* of a church tower is to contain the bells, and the clock follows as a matter of course.

This primary purpose of the existence of a tower we find in many modern buildings entirely ignored; no provision, or at best a most inadequate one, being made for a clock of due proportions, suited to the size and importance of the structure.

Take a few instances at random. The important parish church of Kensington has, indeed, a clock, but it is invisible, and time is given by sound only, the architect having allotted no space for dials. In a busy thoroughfare like this, a clock with face and hands would be of the greatest public convenience, especially as it is by one of the first makers, an exact time-keeper, and cost £1,000. The better half of the usefulness of the clock lies barren and idle, and its value is to a large extent sacrificed.

At St. John's, Hammersmith, there has recently been erected a new tower of fair proportions, and a bell-chamber and an opening for a clock are provided, but the circular space is far too small. The elevation being sixty feet the minimum size of dial should be six feet in diameter. The space actually allotted does not exceed three feet, which will make the clock out of proportion with the building, and too small to be of much service.

Lower down on the same road, the conspicuous church on Turnham Green presents the ludicrous spectacle of a dial stuck half-way down, and in front of an unglazed window-space at the base of the spire,—as if to form a sort of shutter,—the bell-chamber being below, the cart before the horse. In this case, the architect had never contemplated the necessity for a clock, and the present awkward, ineffective arrangement—the dials being far too small for their elevation,—is evidently a make-shift and an afterthought.

Wren's treatment of church towers was very different to that adopted in the cases quoted, for we find that in his plans adequate provision is made for the clock which is *part of the design*, blending with it, and forming with the building one harmonious whole. Surely it does not require the genius of Wren to do this in modern structures. Examples may be seen in St. Paul's Cathedral (south-west tower), Bow Church, Cheapside (two dials nine feet in diameter, at an elevation of seventy feet, one of the most effective clocks in London); St. Bride's, Fleet Street; and many others.

In these cases the clock and bell-chamber, so far from detracting from the symmetry of the architecture—an excuse sometimes made when the former have been neglected or forgotten,—rather improve it, as will be evident on the most cursory inspection of the churches last mentioned.

Turret-clocks, like other things, have not escaped the influence of the modern spirit, which demands a perfection hitherto unexpected. Formerly allowance was made for the difficult conditions under which the clock worked. The disturbance of the hands by wind or snow,[2] the exposure of the movement (popularly known as "the works") to damp, dust, and grit, the effect of the weather on the oil and the metals, the action on the pendulum of extremes of temperature, and other adverse influences were taken into consideration, and the clock was excused if its time-keeping were irregular, as was generally the case. The variation of a few minutes was, from the absence of true time in the neighborhood, perhaps, never detected, or else condoned as the best to be expected, and of no practical consequence, as the mistake would be rectified at the next periodical winding. Indeed, allusion is made by old writers to the custom of allowing a quarter of an hour for the "difference of clocks."

There is no doubt that railways and the electric telegraph have indirectly done much to raise the standard of time-keeping; for the service of trains is regulated by Greenwich time, received daily by telegraph at the terminus, and thence transmitted to the various stations.

Exact time being now required, turret-clocks as the public standards are expected, no matter how exposed their situation or how large their dials, to keep an accurate rate, and not vary as many seconds per week as their predecessors varied minutes. This necessary condition ought to be stipulated for in all orders for new clocks, and makers of repute are prepared to comply with such a requirement.

Turret-clocks are not simply house-clocks on an enlarged scale, differing from them merely in size and weight, but the extra strength of the mechanism involves greater weight of material and increased weight implies increase of friction. It is of the first necessity to provide ample space for the fall of the weights and the swing of the pendulum, in order to make the clock thoroughly efficient and a good time-keeper.

The movement which has to be placed at some distance from the dials must be more powerful than one in close proximity, and forethought on the part of the architect will save expense both in the original cost of the clock and its subsequent repair. Unless sufficient space be provided, it is, indeed, impossible to have a first-class clock that will give satisfaction to its owners and be a credit to its makers.

The popular idea is that a clock is too complicated a piece of mechanism to be understood by any but those engaged in its manufacture, whereas, in reality, its design is extremely simple, consisting of four wheels and three pinions, *i.e.*, very small wheels the teeth of which are called "leaves."

A "silent" turret-clock, of the most simple construction, has the following train of wheels: —

MAIN WHEEL, turns once in 4 hours, and has teeth	CENTRE WHEEL, turns once an hour, carries the minute hand, and has teeth	THIRD WHEEL, turns once in 7½ minutes, and has teeth	ESCAPE WHEEL, which drives the pendulum, turns once a minute, and has teeth 30
		60 gears into	...Pinion of 8 leaves.
	64 gears into....	Pinion of 8 leaves.	
80 gears into..	Pinion of 20 leaves.		

The action will be readily understood from the diagram of the "train of wheels" given above.

Each wheel, excepting the main-wheel, has a pinion (small wheel) on its arbor or axle. To the main wheel is attached a drum, which carries a weight to supply the motive power. The pendulum, we will suppose, oscillates once a second, it will, therefore, take a double oscillation for each tooth to pass the pallet, consequently the escape-wheel, with thirty teeth, will revolve once a minute.

There is no arbitrary rule for the numbers for the teeth, which can be varied so long as the due proportions are retained. As the escape-wheel turns sixty times to one turn of the centre wheel, the method for determining the numbers will be as follows: —Multiply the teeth of the intervening wheels (viz., the centre and third) and divide the product by that of the leaves of the pinions similarly multiplied, and the result, if the train is true, must always be sixty. This we shall find to be the case in the present instance: —

$$\frac{\text{Centre Wheel } 64 \times \text{Third Wheel } 60}{\text{Third Wheel Pinion } 8 \times \text{Escape Wheel Pinion } 8} = 3{,}840 \text{ divided by } 64 = 60.$$

In like manner, the rate of motion of the arbor or axle which carries the minute-hand has to be reduced for the hour-hand, which is set on a pipe through which the centre arbor passes. This is done by two pinions and two wheels, the pinions in this case driving the wheels, and not *vice versâ* as in the movement. The leaves of the pinions when multiplied must be one-twelfth of the product of the teeth of the wheels, because the minute-hand turns twelve times to one turn of the hour-hand.

The best clocks are usually made with wheels of gun-metal or hardened brass, the teeth being divided, cut, and polished by steam machinery, and finished without the aid of the file, emery-paper, or other polishing materials, so that the most minute difference is prevented and accuracy insured to the one-thousandth part of an inch. The pinions should be of hardened steel, cut from the solid, and made in the same manner as the wheels.

In cheap clocks constructed chiefly for public companies who give their contracts to the lowest tender irrespective of quality, iron is frequently used instead of steel, both for the pinions and arbors (axles), and cast-iron takes the place of gun-metal or brass in the wheels and bushes. These clocks are generally the production of firms who combine engineering with clock-making, and are naturally anxious to make one plant serve two purposes, notwithstanding the dissimilarity of the two pieces of mechanism under manufacture.

The result is that clocks thus made are faulty time-keepers, and that, owing to friction, rust, and brittleness — for iron wheels, however well made, are very liable to chip or break, or to oxidize and decay, —such clocks have, in a comparatively short space of time, become worn out and useless.

This opinion as to the unsuitability of cast-iron has been, I am aware, controverted, although no amount of argument can alter the facts, which are as stated.

It has, however, been said that "as soon as you cut off the friction of the train from affecting the escapement, it is obvious that cast-iron

[1] Reprinted from the *Builder*.

[2] This is not a fanciful supposition. The snowstorm which occurred early on Sunday morning, March 22, of the present year, stopped the great clock at Westminster and more than half the public clocks in London, the accumulation of snow on the hands overpowering the clock. Even in cases where the clock was not stopped, the hands would be retarded in their progress and thereby cause a loss of time.

wheels are just as good as brass or gun-metal." But it is not so. You never can prevent the friction of the train from affecting the escapement,—*i.e*, that part of the clock which regulates the discharge of the power imparted by the main-wheel. The celebrated Ferdinand Berthoud has proved in the case of watches, that "no escapement can have any influence over the main-spring, and consequently that it cannot correct the inequalities of the motive power from being transmitted to the balance, whose velocity is retarded or accelerated in conformity with the irregularities of the main-spring." And the same is true as regards clocks, any variation in the uniformity of the motion of the train communicates itself to the escapement and thence to the pendulum.

Moreover, the action of the escapement is to regulate the time, and not to correct defects in the mechanism, and to require from the former results it was not designed to give, can only end in disappointment.

A further argument is that cast-iron wheels, with smaller teeth than any used in turret-clocks, are successfully employed in spinning-machinery; but it is evident that the cases are altogether different, for the motive power in the latter instance is steam, the great force of which will drive the machinery even when the wheels are somewhat defective; besides, the evenness of the rate of motion is unimportant, provided the machine does the work assigned to it.

But in clock-work, none of these conditions obtain; the motive power, derived from the descent of a weight, is, compared with steam, very weak and consequently altogether inadequate to resist the inertia of defective wheels, whilst an even rate of motion is of the highest importance, and its absence would render the whole machine useles.

The most experienced person will see that wheels cut from the solid metal, hard and close in texture as gun-metal or brass, must be more efficient and reliable than cast-iron, the roughness and other defects of which are well known.

So far from brass corroding, as is sometimes asserted, in town atmospheres, old clocks may be seen with brass wheels that have been in action for more than 100 years and are still perfectly sound and good.

It must be borne in mind that the efficiency of a clock depends no less upon the materials and workmanship than upon the plan of construction; for if the metals used are liable to wear away by friction or corrode by damp, the most perfect design in theory will fail in practice.

The same is true as regards workmanship; unless the various parts are made with the greatest accuracy, all roughness removed from the edges of the teeth, and the surface of the acting parts made smooth and clean, friction is inevitable, and the clock soon cuts itself to pieces.

Too much care, therefore, cannot be given to details of manufacture, as an apparently slight defect in execution will be sufficient to spoil the uniformity of the rate of time, and thus detract from the efficiency and value of the clock.

The introduction of steam machinery has added to the accuracy of clock-work, and at the same time considerably diminished its cost. A turret-clock can now be produced for the sum of £150, which will excel in superior construction and accurate time-keeping one that a half a century ago would have cost £800, and the practical result is seen in the largely-increased number of public timepieces.

As the purchaser of a clock is not usually in a position to judge of its merits, he must rely upon the reputation of the maker, who, if he is an actual *bonâ fide* manufacturer (their number is very limited), and not a mere clock-seller, will be able to refer to public clocks erected by him in different parts of the country, so that independent inquiry can be made as to the efficiency of his instruments.

The winding of the clock seems a simple affair, and yet special precautions have to be taken not to derange the working of the machine.

If the drum which carries the weight were part and parcel of the great wheel, the winding would reverse the action, put back the hands, and utterly disorder the instrument. To prevent this, the drum has a ratchet or saw-toothed edge, into which fits a stop falling from the inner edge of the great wheel, and kept in its place by a spring: so that, turning in one direction the drum will drive the wheel; turning in the other it is free, the stop slipping over the teeth in a somewhat similar manner as the pawl in a windlass or capstan. By this means the revolution of the great wheel during winding is left undisturbed.

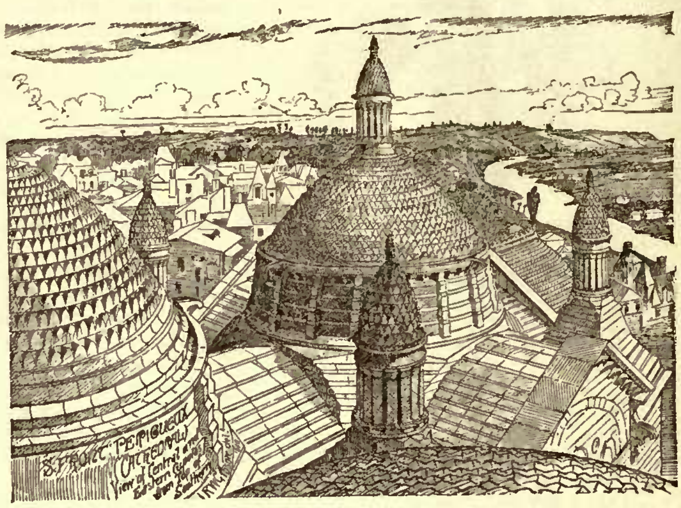
A second point to provide for is the *continuation* of the motion. As the act of winding takes the motive power off the great wheel, it is obvious the clock would stop, and the action of the pallets (for the swing of the pendulum would go on for some time after the stoppage of the train) upon the finely-cut teeth of the motionless escape wheel, would probably injure them,—unless some means were found to continue the action until the motive power is restored. This substitute, technically known as the "maintaining power," is of the greatest importance in large clocks, the winding of which takes some minutes.

The mechanism employed by the best makers is of a simple character, yet thoroughly effective and reliable. Its action is as follows: —To gain access to the winding square on which the key fits, the attendant must first raise a lever, one end of which being wedge shaped, gears, on being thus raised, into the teeth of the great wheel, and the other, being sufficiently weighted, supplies the motion. The winding completed, the lever gradually drops, with the revolution of the wheel, into its old position.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

PERIGUEUX CATHEDRAL, FRANCE.



The Cathedral of St. Front at Periguex is one of the most curious in Western Europe, not only on account of its architectural merit but because of its, strange dissimilarity with the styles of architecture native to the locality. Fergusson mentions this ("*History of Architecture*" Book II, Chapter II) but does not give a very lucid explanation of it, although the ethnological phase of architectural history is prominently treated in this work. James F. Hunnewell ("*Historical Monuments of France*") explains how the edifice was made a reproduction, as far as their means allowed, of Venetian San Marco by a Venetian colony of merchants who commenced it in A. D. 984. This is possible, as St. Mark's was commenced 977 and finished structurally 1071, but not probable. The leading archæologists agree that the beginning of the eleventh century is the date of St. Front and that the earlier work (which may well date from 984) is an ante-church at the west end of the present one and comparatively small. Be this as it may, Perigueux Cathedral is a structure in the Byzantine style of the East rather than the Romanesque of Western Europe.

It is in ground plan a Greek cross covered by five domes (see plan) supported however upon pointed arches. The main piers are very severe and massive. They were originally too weak and were strengthened by outer casings of stone which exaggerate the ponderousness of effect. The whole of the edifice has been restored, almost reconstructed so thorough has been the work, and much has been done apparently without sufficient data or proper regard for it, for certain features have an air decidedly modern French. But in the main the restoration is gratifying, and it is certified in many places by fragments of the ancient work itself, left in place to attest the correct re-production of the design. Of course the interior is very bare and cold. It is a style which requires lavish adornment in paint and gold and mosaics to reach its greatest force.

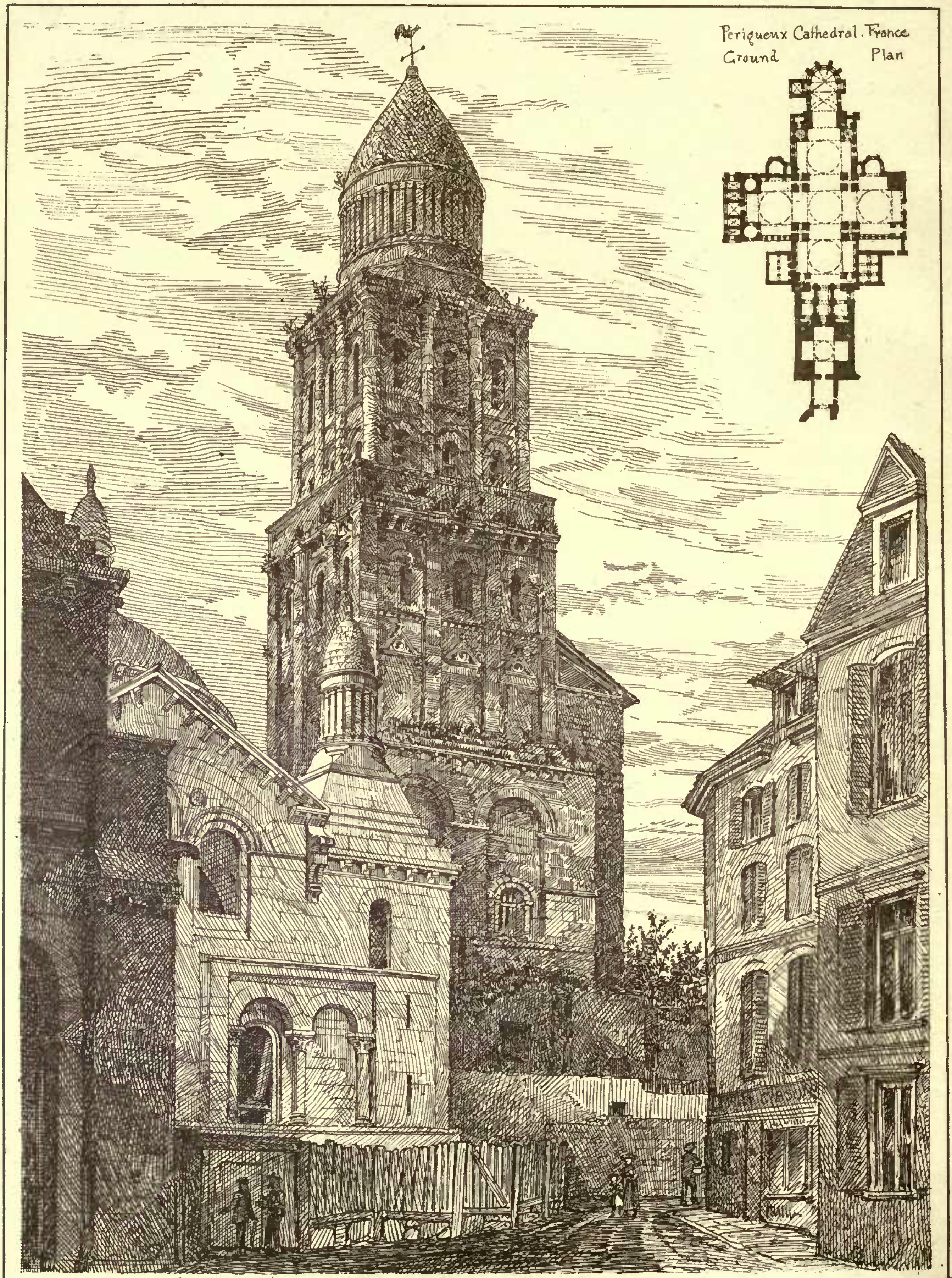
Externally the Oriental character of the building is very marked. The domes are surmounted by cupolas upon closely-set shafts, and similar cupolas stand upon the intersection of the great arches. The view of the central and eastern domes, taken from the top of the southern one, will explain much that is very interesting in the building. The surfaces of all the domes and cupolas are cut into upward pointing scales, giving an effect a little like that of some fir-cones. It is a very handsome enrichment for its situation, but of course utterly inappropriate in a severe climate. All the external oofs are of stone — vaults above those visible from within, with a few feet between. This is without doubt the most monumental method which has been contrived by man of closing in a building, and it is a subject of repeated regrets that the destructive effects of cold debar us in the north from its use. It would succumb to the winters of New England or New York in a few years, yet in more temperate climates it endures for ages.

The tower of St. Front is an interesting piece of Romanesque work, weather-worn and bursting into vegetation apparently, the grasses and plants finding roothold in its crumbling masonry at every projecting ledge. The upper part only, a domed cupola upon closely-set shafts shows close relationship with the church. When the sketch was made this tower was the only part of the cathedral which restoration had not yet disturbed. R. W. Gibson.

FACADE OF THE CHURCH OF S. MARIA DELLA PIEVE, AREZZO, ITALY. MARCHIONNE, ARCHITECT.

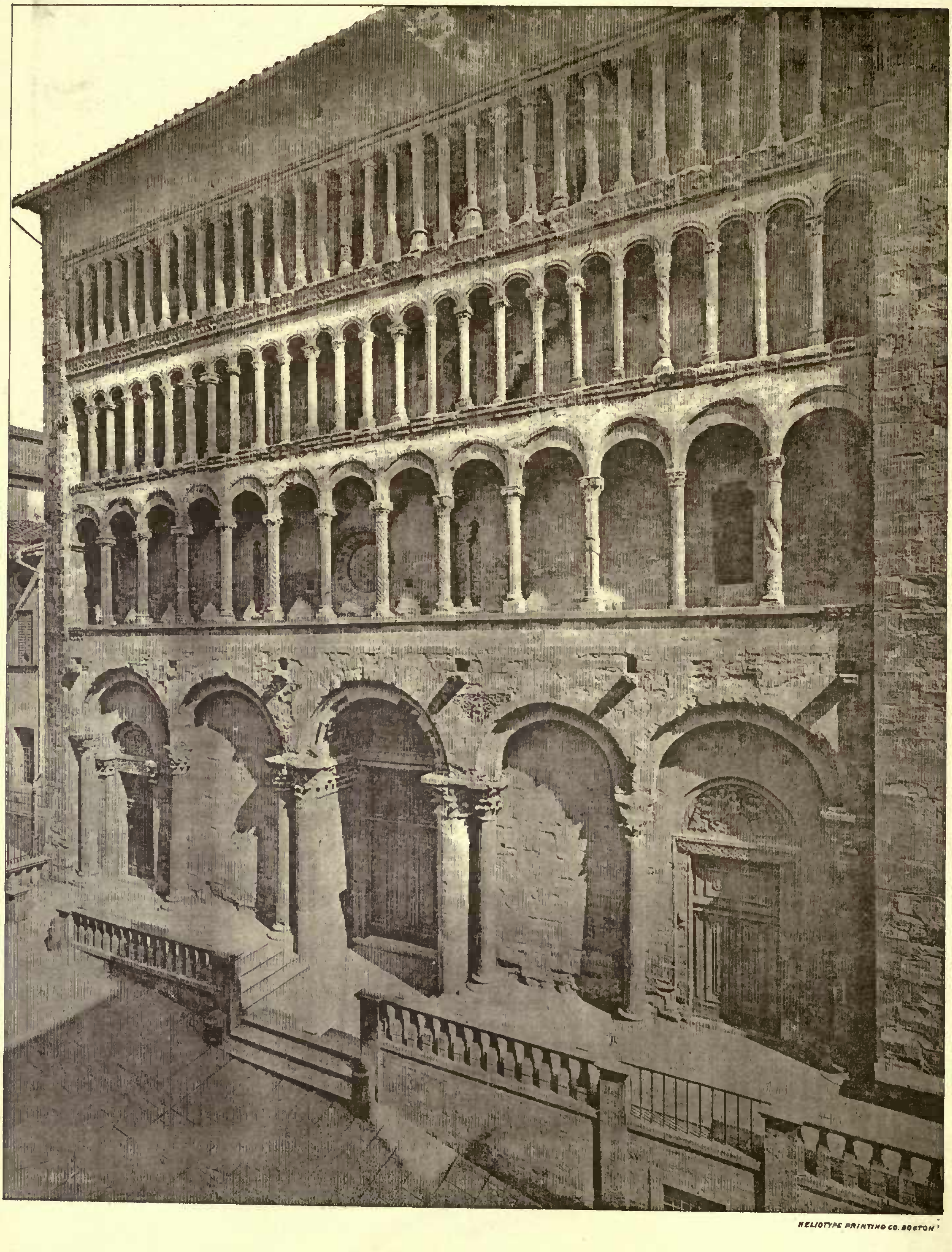
This building which stands on the site of an ancient temple of

No. 507 American Architect and Building News Sept. 12 1885



Tower Periqueux Cathedral France. Before Restoration
Restored North Transept and Nave

No. 507 American Architect and Building News, Sept. 12 1885



HELIOTYPE PRINTING CO. BOSTON

Facade of the Church of S. Maria della Pieve, Arezzo, Italy.
Marchionne, Arch't.



Peep of the bay from the head of the Common.

SKETCH
COH

by E.Eldon.De



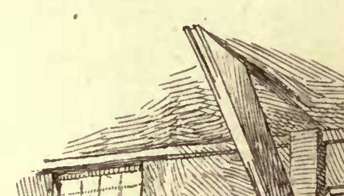
Old house on the Common.



Spire of

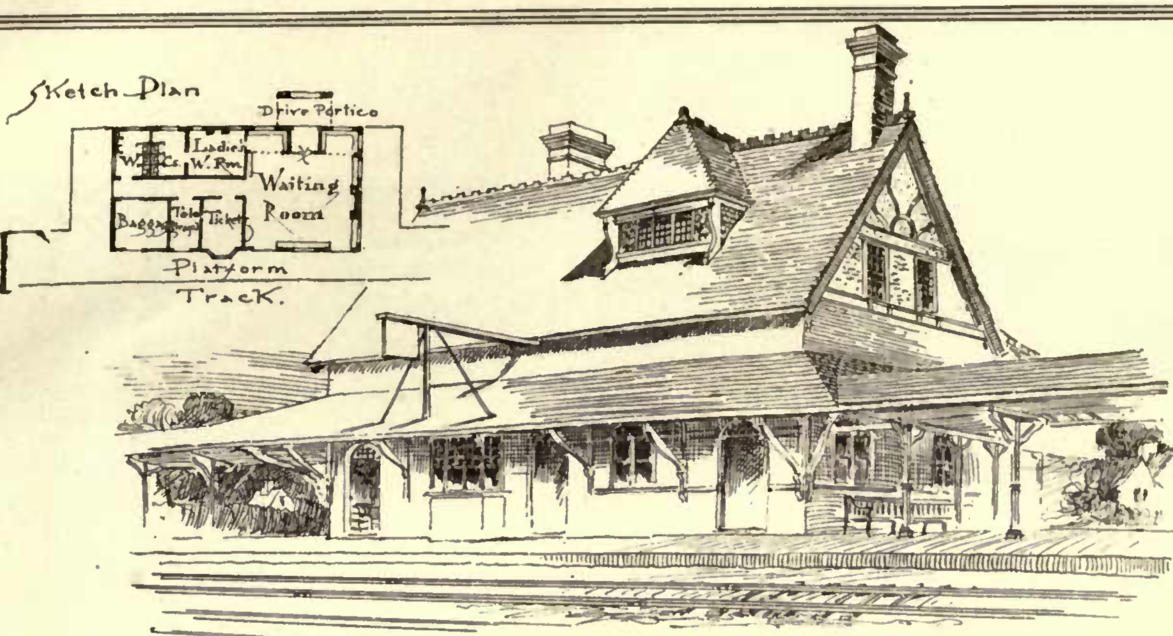


Parsonage House built by Revd. N. Hobart - first minister of the old Church. 1721-4.



...R. OSGOOD & CO

...IN *
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...ASS *



New Station of the Old Colony R.R.
J. F. Hurd. Archt.



Waiting Room. New Station.

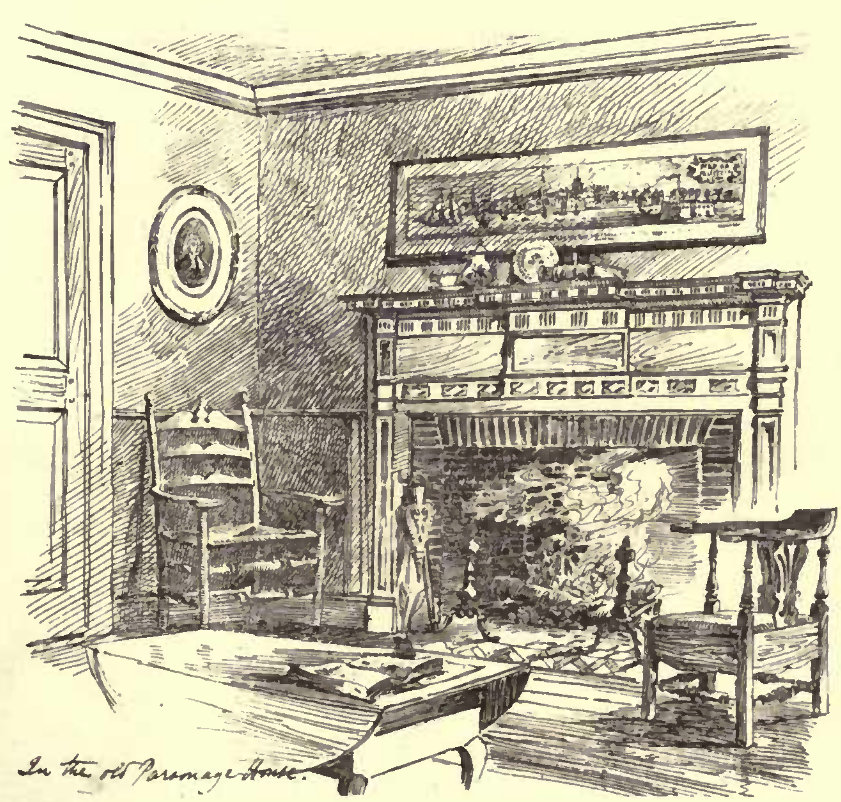


...l Church. built 1741:



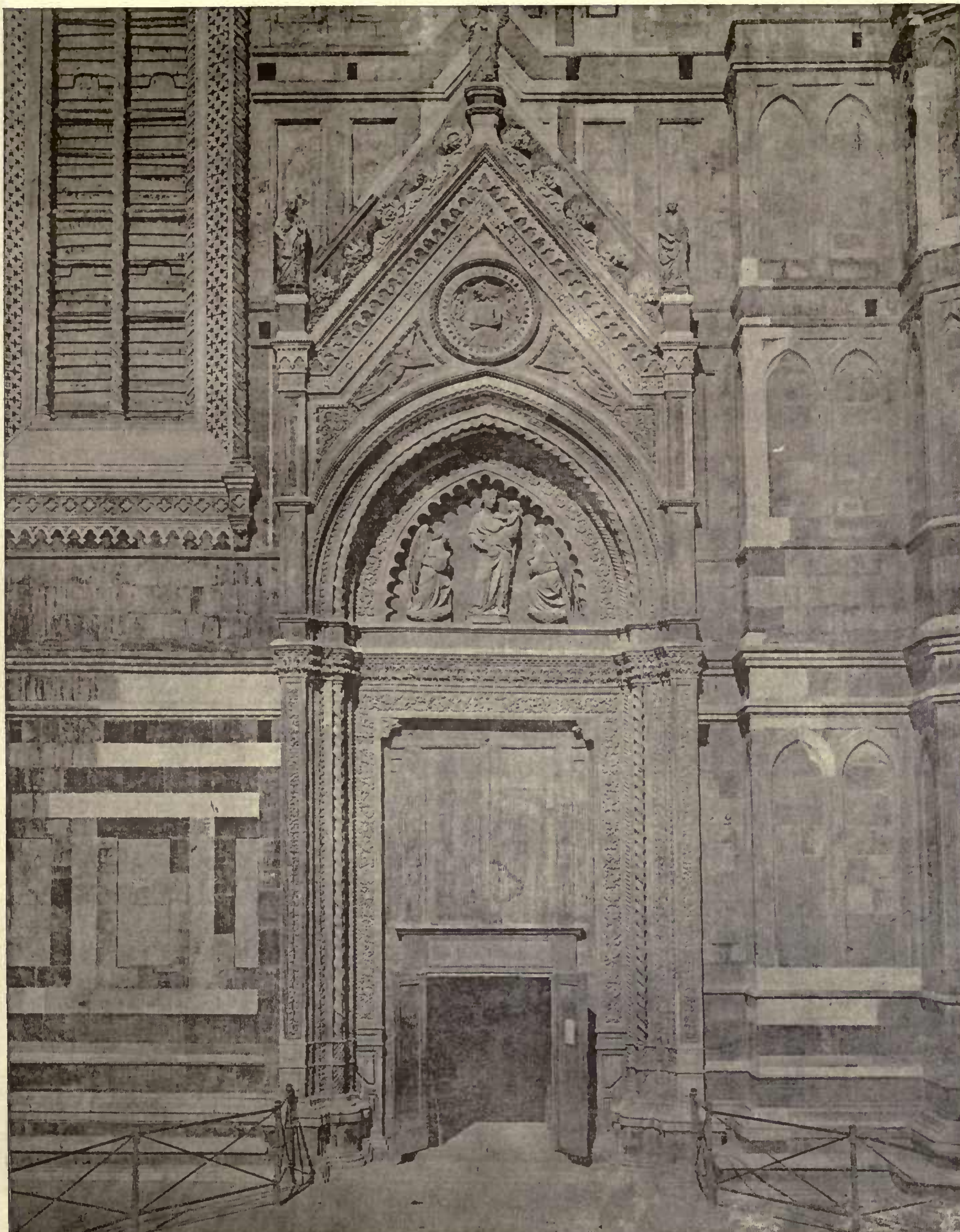
(Pulpit modern)

...ing-board in the old Church.
...e Pulpit —.

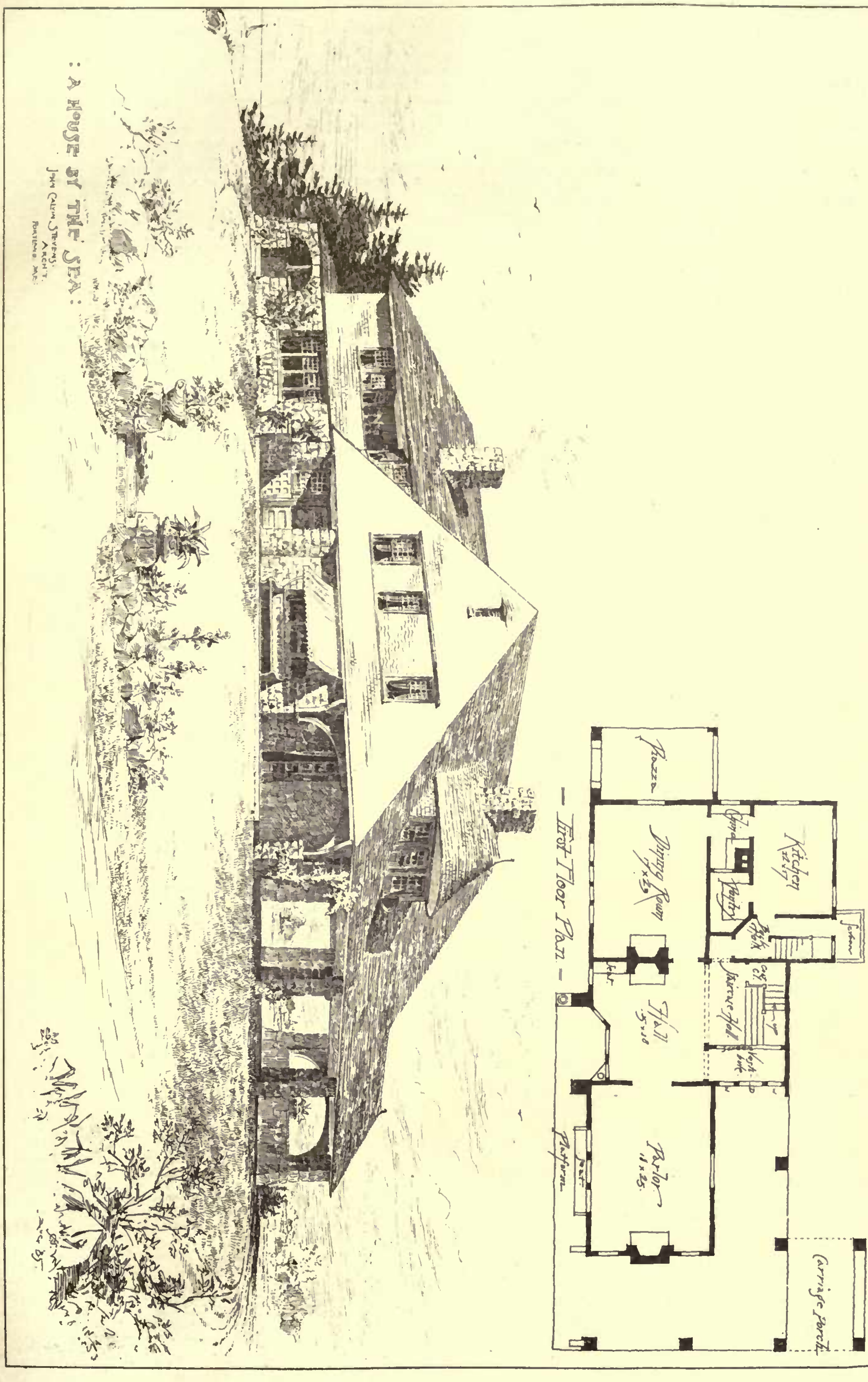


In the old Parsonage House.

HELIOTYPE PRINTING CO BOSTON



South Doorway of the Cathedral, Florence, Italy.



HELIOTYPE PRINTING CO BOSTON

Bacchus was begun in the ninth century. The façade here shown is, however, attributed to Marchionne, a local architect, and dates about 1216. The columns of its three arcades form either a very marked instance of the way in which architects pillaged older buildings in the interest of their economical clients, or a still more extraordinary striving after originality on the part of the architect.

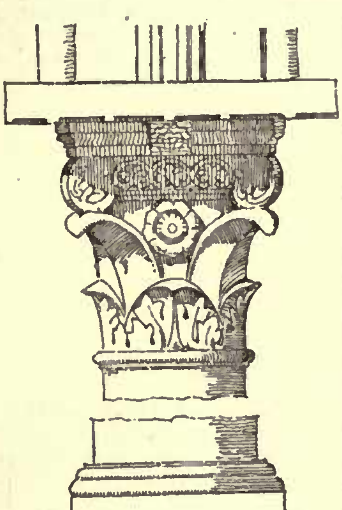
A SKETCH FOR A SEASIDE HOUSE. MR. JOHN CALVIN STEVENS, ARCHITECT, PORTLAND, ME.

THE sketch was one made last year in the course of business, but was abandoned for a smaller house. The estimated cost finished in pine was $10,000.

THE SOUTH DOORWAY OF THE CATHEDRAL, FLORENCE, ITALY.

SKETCHES AT COHASSET, MASS.

BOOKS.



From the Church of San Frediano, Pisa.- Italy.

ONE does not, as a rule, expect to find æsthetic, as distinguished from intellectual pleasure, in the study of a book on applied mathematics, but an exception would certainly be made in favor of Professor Lanza's book,[1] which possesses in a singular degree the charm which clear and forcible expression always gives, whatever may be the subject treated of. It is to be expected that definitions and axioms in mathematics would be stated with all practicable conciseness, but those in this book are so condensed, so brimful of concentrated thought, that one reads them over and over with increasing enjoyment. The definition of force, for instance, which Professor Lanza calls "a tendency to change the relative motion of the two bodies between which that tendency exists," is, to our mind, a masterpiece of scientific English.

Starting from this point, the author proceeds to show the proportion of forces to velocities and momenta; and leads us to the consideration of the path which a body would take if acted upon simultaneously by two forces acting in different directions, which he shows to be represented, for a unit of time, by the long side of a triangle of which the other two sides represent the paths which the body would pursue if acted upon by the two forces successively, each during a unit of time. This is, to us, a new method of reaching the subject of the "parallelogram of forces," or as he calls it, more exactly, the "parallelogram of motions," and it seems to us as much superior to the common mode of treatment in brevity and intelligibility as it is in scientific accuracy, and in the skill with which it is made to lead directly to the subsequent propositions of the polygon of motions, and the triangle and polygon of forces.

A few every-day problems, solved both graphically and algebraically, serve to indicate the application of these principles in the way best suited for fixing them in the minds of students, and form an excellent introduction to the analysis of trusses and frames, which, after the theory of dynamics has been discussed, introduces the practical part of the book. This subject Professor Lanza, unlike other writers, divides by a sharp line between roof-trusses and bridge-trusses, treating the former, among which he includes polygonal frames and funicular polygons, by the usual graphical methods, or rather, by an improvement on these methods, which consists in drawing the stress diagrams, and calculating the lengths of the lines in them by trigonometrical processes, instead of trusting to the scale; but considering bridge-trusses only analytically, by the method of sections, which he considers to be more convenient in practice for such work than either the graphical or the graphical-trigonometrical processes. Many examples are given, both of roof and bridge trusses, the effects of wind-pressure are discussed, and constants given for the weights of different sorts of roofing materials, the whole chapter forming as clear and concise a treatise on the subject of the calculation of strains in roofs as architects or students could easily find. The only thing we can think of to increase its usefulness to them would be the addition of some illustrations of the common joints in wood and iron trusses, with, suggestions as to the estimation of the strains in pins and straps, and perhaps, the suppression of Hutton's wind-pressure formula and table, which, being based on erroneous premises as to the maximum force of wind, are worse than misleading, and the correction of the engraver's mistakes in some of the illustrations of strain diagrams, particularly Figures 85*a* and 86.

The subject of the transverse strength of beams follows that of stresses in frames, instead of preceding it as in the common text-books, and with it we find an immense amount of information as to the constants to be used, not only for resistance to transverse strain, but for tensile strength and power of resisting compression, in iron, steel, and various kinds of timber. Professor Lanza's tests of full-size beams and posts of wood have already been described in this journal, and most architects and engineers, as well as many builders, know that they have entirely upset the old rules on the subject, but the compilers of building-laws, and others who have not yet had their attention called to the matter, may, perhaps, be interested some time to find in this book not only an account of the tests, but a comparison of the results with the ancient standards, which is very instructive.

The latter portion of the book treats of arches in iron and stone. The usual method is given for passing lines of resistance through the voussoirs of a stone arch, and some sensible practical remarks are made, among these being the observation, which we think we never saw before in a theoretical work, that the actual vertical load on each voussoir of an arch in a wall is not, as is usually assumed, the weight of the slice of masonry, loaded or otherwise, over it, extending to the top of the wall, but is an unknown fraction of this, determined by the bonding of the brick or stone-work of the wall, the quality of the mortar, and the other circumstances which enable walls to support themselves, by the corbelling, as we say, over an opening, leaving only a certain remainder either to bear upon an arch, spanning the opening, or to fall down if the arch is removed. In regard to this corbelling action, which vitiates all our calculations in regard to arches in high walls, Professor Lanza well says that "we need experiments;" and until these are made and recorded with something of the accuracy and care which he has shown in his own tests of beams, we must be contented to leave the subject in its present unsatisfactory condition.

ANY one who has been in the habit of noticing in the English architectural journals the representations of buildings erected in India after the designs of English architects, must have felt that a sacrilege was being done to the canons of Indian art that Vishnu, Shiva and all the rest might be justified in avenging, if perchance the days of miracles had not passed away, as one is sometimes tempted to believe they have not when he reads of the magical performances of Indian jugglers. It is somewhat of a relief that the worst of the barbarisms of design are not committed by architects, but by civil or military engineer officials in the employ of Government, the East Indian Company, or the railroads. An unusually atrocious structure, a clock-tower at Delhi, is shown in a recent issue of the *Manufacturer's Gazette*, in which bastard Victorian Gothic runs riot.

It is a relief to turn from this to a book [2] of heliotype illustrations of bits of domestic Indian architecture, collected by Mr. De Forest during a protracted residence in India. In turning over these plates one gets a glimpse of what Mr. Fergusson means when he suggests that the coming architecture may be a revival of Indian forms and decorations adapted to European uses. It is possible that a modified Hindoo architecture may be the next "fad" the English architects, tired of coquetting with Queen Anne, will take up, but one can't help but pity in remote perspective the tribulation of the careful housewife if she is to be compelled to keep in immaculate freedom from dust all the crevices of this wonderful fret-work of carving and inlay.

The illustrations are unexplained by text, and though there are titles given, the dates and epochs are not, so that one cannot trace what are the determining causes of many features in which are discoverable traces of Chinese, Moorish and Arabic art; while in some cases, for instance, the doorway of a house at Multan, there is a very marked Renaissance feeling in the sculptured detail. In most cases one is free to imagine that the carvings are executed in stone, stucco, wood, metal or iron, according to his fancy or his knowledge of Indian art, feeling that because of the cheapness of labor in India it is quite as possible that one material should be used as the other.

To utilize this cheapness of skilled labor, is we believe, largely the aim Mr. De Forest had in putting forth this book which purports to show the kind of work which the skilled artificers he has got together in Ahmedabad can even at this day perform. We suppose there is a commercial side to the matter, but as it does not appear in this publication, we can blink it in considering the book, and only regard the other claim that is advanced — that it is an outward indication of an attempt to prevent the entire extinction of native skill and art instinct by the advance of Brumagem and its vandal hordes. Just what use to-day can find for Indian art in its grosser constructional forms it is hard to say: they would probably look as out of place in New York or London as the English architecture of the day does look like an architectural tramp at Delhi or Singapore. But for the smaller features, the surface ornamentation particularly, we believe there can be found many uses which will suggest themselves to any designer who sees these, or similar plates. There is nothing here to show that the Hindoo of to-day can work as deftly as the men who wrought these delicate and graceful geometrical screens, these fretted panels that make one forget that the designers were very paladins of plane geometry, so easily do they seem to fit into their alloted place

[1] "*Applied Mechanics*," by Gaetano Lanza, S. B., C. & M. E., Professor of Theoretical and Applied Mechanics, Massachusetts Institute of Technology. New York: John Wiley & Sons, 15 Astor Place, 1885. Price $5.00.

[2] "*Indian Domestic Architecture.*" New York: Lockwood De Forest, 1885.

in the sketch; but we do know that Major Keith caused to be designed and carved for the Calcutta Exhibition an elaborate gateway of considerable size, for the purpose of showing that the native of to-day is still able, given the opportunity, to do the work on as airy and refined a structure as the Taj Mahal, if there can be found the master-hand to design it. These efforts to preserve from entire extinction the native art of India is deserving of all praise, and we trust that similar but more organized attempts will be made to preserve the art of the Japanese and Persian artists from being overwhelmed by the advance of the London and Parisian upholsterer.

Two little hand-books of very dissimilar interest and value by the same author are issued by different publishers. The contents of one [1] of them appeared in our own columns a couple of years ago, and such value as it has is rather of an archæological and encyclopædic than practical nature. Still any one who has a desire to study up the history and development of that most unpleasant article, the water-closet, will find that Mr. Brown has brought the facts together in their proper sequence, though he has contributed little to the development of the still-to-be-attained perfect closet by comment or discussion, the greater part of the book being essentially mere abstracts of the patent specifications describing the several closets, many of which were presumably never put on the market. The most interesting portion of this book is that describing the methods of disposing of excreta practised at Rome in the Middle Ages.

The other little hand-book[2] much more attractive in make-up, better illustrated and more valuable from the practical stand-point, deals with foundations, and is a reprint of a series of articles which we should have said we first saw in the *Sanitary News* but which are here credited to the *Sanitary Engineer*. The subject is an important one; too much care cannot be taken in securing the proper drainage of the cellar and foundation trenches, as we had unpleasant proof of not long ago when building a house on the very top of a hill, the highest level within a considerable area. The soil was a very stiff hard-pan and was found to be almost bone-dry at the level of the cellar floor, a little water only standing in the trenches, so, as it was very severe digging, the drain was only carried a short distance and ended in a dry-well. Still, as there was a possibility of trouble, the floor was not concreted. All went well till the middle of February, the floor remaining dusty, then dampness appeared, and at length in consequence of thaws and rains several springs declared themselves in different places. Bailing was at first tried, then a pump was rigged through the parlor floor, discharging through a window, and a gang of men tried for days to pump out the cellar as if they were trying to keep a ship afloat. All was in vain and finally, though mid-winter, a drain three hundred feet long had to be dug from the bottom of the trenches to the brow of the hill before the eighteen inches of water could be drawn off. Any one who does not desire such an experience as this will do well not to trust to appearances but make thorough work of his foundation drainage after some of the many methods described by Mr. Brown.

AMONG the little books which accumulate on our table much more rapidly than those of greater bulk and cost, the one of greatest everyday value is a very ingenious set of tables[3] for determining at a glance the number of treads that can be worked into a given run and the number of risers needed to reach from one floor to the next. The mode of using the tables is clearly explained and readily understood, and they are of such practical benefit that every office should have three or four copies, not only because several draughtsmen might wish to use them at the same time, but because being quite small they would easily get mislaid under drawing-boards or papers.

ANOTHER little book,[4] an amusing little book because it is written by a sensible man who has a *penchant* for getting up little books about things which many people would think were too common to write about, contains, quite unarranged, the desultory bits of advice that the writer, a layman, would give to any one intending to build a house. We ran through its thirty pages first with the expectation that we should come upon a number of the half-witless suggestions that even a usually sensible man may make when attempting to give instructions on subjects outside of his usual occupation. But though we found some things that are not quite "according to Gunter," there is really little to find fault with. We then turned over the pages again in the hope of finding a hint or two that even the trained architect might welcome, but found only this: "The flues should have large man-holes in them in the attic, so that large openings can be made in them to draw off hot-air in summer. These holes may be covered with sheet-iron in winter. I made my attic cool and comfortable by this means, after a servant had given me warning that the upper room was too hot to live in, and it cooled the whole house;" a manner of phrasing which leaves one in doubt whether the servant's "warning," or the chimney-opening was the efficient cause, and hence the subject of the recommendation. The idea is ingenious, but should only be carried into effect under competent advice, and even then should be only used in the house of a careful man who will surely see the sheet-iron door properly closed before the autumn fire is lighted. To most of the pithy recommendations we can say amen.

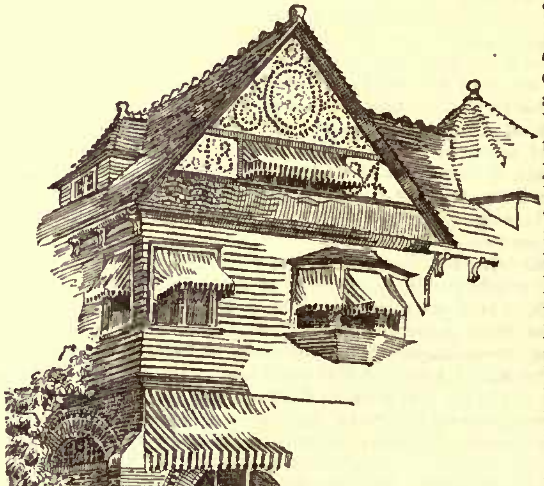
THE smallest book[5] of all is in the form of a note-book for the vest-pocket, bound in pliable Russia leather, with rounded edges, and relatively to its bulk is as valuable as any, far more valuable than one would suppose on first turning over its pages, since it has the appearance of being a money-getting undertaking, advertisements appearing with unpleasant prominence on every page, and seriously inconveniencing any one who seeks to make use of the data, tables, laws, etc., which are supposed to form the subject-matter of the book. The advertisements which all relate to building affairs are useful too, but they would have been quite as useful if set in uniform and less obtrusive type. The compiler has had the good sense to do what other compilers have generally neglected, that is, he has, as a rule, named the authorities from whom he has drawn his statements, so that one may feel reasonably safe in putting this booklet into his pocket, and really making use of it "on the job" when the rest of his library is not accessible. But the difficulty of finding what one wants, notwithstanding that there is an index, because of the confusion caused by the advertisements makes us feel that it would be more judicious to spend one's dollar in another way.

TWO other marvellous little hand-books have also come to hand, one[6] of which begins with the "pithy fact" that the aggregate circulation of the daily newspapers in this country, is 4,800,000, and ends with the statement—much more pithy, by the way,—that the poorest of twelve millionaires named, Baron Rothschild, is worth $15,000,000; while the other,[7] beginning with a table showing how logs may be reduced to board measure, ends with a collection of album selections, the last one running: —

For something original
I've been puzzling my brain
At last I've concluded
To just sign my name.

These useful — or useless — little books contain a most varied collection of information: tables of board measure, weights, population, interest, rainfall, temperature, presidents, fastest one-mile time, distances, mortality, lengths of rivers, heights of mountains; lists of literary pseudonyms, meanings of personal names, notable bridges, tallest towers; the popular names of states and cities; facts concerning government, business, history, and much else which one simply looks over and wonders whether it is all true.

THE USE OF IMPERVIOUS COVERINGS ON FLOORING OF WOOD.



AT the present moment considerable attention is being given to the subject of impervious coverings on flooring of wood, and the admitted hasty decay of the same has raised the question whether it is traceable to want of ventilation on the underside or to the covering on the upper face.

The use of wood as a ground-floor material is matter of recent history, flooring of brick or stone being general in former times. During the last quarter of a century wood, from the abolition of the duty, and the introduction of machinery, has been cheapened to such an extent that it is no longer a luxury for flooring, but the cheapest material that falls to the hands of the builder.

It is an undoubted fact that free ventilation on the underside of

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[1] "*Water-Closets.*" An Historical, Mechanical, and Sanitary Treatise. By Glenn Brown, Architect, A.A.I.A. New York: The Industrial Publication Company, 1884.

[2] "*Healthy Foundations for Houses*," with 51 Illustrations. By Glenn Brown, Architect, A.A.I.A. Reprinted from the *Sanitary Engineer*. New York: D. Van Nostrand, 1885.

[3] "*Treads and Risers.*" Architects' and Stair-Builders' Table of Treads and Risers. By John A. Hamilton, Architect. New York: W. T. Comstock, 6 Astor Pl., 1885.

[4] "*Hints on House Building.*" Some desultory notes in popular form, reprinted from the *Mechanical News*. By Robert Grimshaw. New York: F. Treadwell, 78 Nassau St., 1885.

[5] "*Useful to Architects*," and all interested in Building. Practical information upon special matters relative to exterior and interior work, with a directory of builders, masons and contractors. Valuable tables, memoranda and formulæ. Price $1. New York: B. G. McKay, 1168 Broadway, 1885.

[6] "*Look Within*" for 5,000 facts that every one wants to know. The pith of many books, compiled by W. R. Adams. Chicago: A. H. Andrews & Co., 1885.

[7] "*Gaskell's Hand-Book of Useful Information*," for Merchants, Professional Men, Mechanics, Farmers, etc. Compiled by E. A. Gaskell. Price 25 cents. Chicago: George W. Ogilvie, 230 Lake St., 1884.

wood flooring is beneficial to its preservation; but whether the flooring is sealed down on the upper side or not with floor-cloth, kamptulicon, etc., it is subject to decay in the warm or summer season, for there is invariably sufficient moisture and heat to propagate fungi, of which family the destroying agent of wood is a member.

In the last century the belief was general that ground-floors in wood could be preserved by the spaces between the joists being levelled up with dry or quick lime. We have seen flooring so laid on oak joists in use for over a century, and when removed found to be in fair condition, but only in the instance of their being laid over brick arches covering basements. If this system were followed in floors immediately over the soil, the result would not be satisfactory. Nevertheless, lime in proximity to wood, if kept fairly dry, is a preservative of no mean order, proof of which is afforded by plasterer's laths, timbers built in walls, and vessels used in the lime trade.

With regard to the free ventilation of the spaces beneath wood flooring, this is rarely necessary in floors above the ground level, as moisture is not present in these cases in sufficient volume to propagate the dry-rot fungus. In the instances of ground-floors, free ventilation often becomes an evil to the inmates of the houses, in the air passing through the flooring, skirting and other wood-work to the interior of the rooms, and rendering them so cold in the winter season that the fires have little power in warming the apartments. This evil may be remedied by the ventilators being closed in the winter, for there is no fear of the wood decaying at this cold season.

Free ventilation, as we call it, is not always insured by air-grates below the level of ground-floors, for the air may become so charged with moisture in these confined spaces that it will not, owing to its weight, move in the manner intended by the builder. There is a tendency in cold, humid air to occupy a low level, and it is not a safe rule to rely upon side ventilators to deal with such strata. An excellent plan for dealing with the air beneath basement floors is to build up, along with the chimneys, flues for its extraction.

The use of impervious covering on the face of ground-floors is to be condemned. Wood is a porous substance, and the air beneath is constantly passed through the boards, being drawn by the more rarified character of the air in the apartments above. The same action obtains with upper floors, and ceilings beneath the roof, lath-and-plaster offering no impediment, so long as it is not painted. In proof of this you will find in ceilings not regularly whitened, the spaces to be dark, owing to the soot-laden air being filtered as it passes through the plaster, whilst the plaster covered by the joists above is light, and hence the white marks across old ceilings indicating the lines of the joists.

That moisture does pass through such floors we can give proof in the case of a first floor of some property which had been erected over fifty years. The ground-floor was used as a cooking and work kitchen. This floor was covered with oil-cloth, by which the air was prevented from freely passing through the ceiling and the floor boards. The boards themselves became damp on their undersides and swelled, which caused the lines of the joints to rise on the upper face, and the floorcloth to present a series of ridges and furrows, every joint of the flooring being clearly marked.

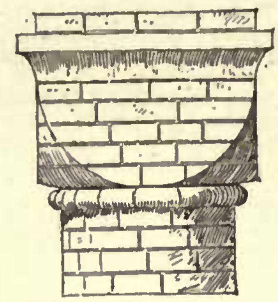
We had our attention called to the wood floors of an exchange building, where the basement was used as a restaurant. Between the joists, at certain points, steam-pipes were fixed under grating for warming purposes, the face of the board being covered with kamptulicon; there, in the winter season, during which, under ordinary circumstances, the flooring would be safe, dry-rot fungus was engendered, and to such an extent did it propagate that in four years, owing to the presence of heat and moisture, the floor was destroyed. A new floor was laid, and the system of impervious covering was abandoned, since which no sign of dissolution has presented itself. The reason of this is to be found in the fact that with the impervious covering removed, the heat, in the absence of confined moisture, was unable to propagate wood-fungus or dry-rot. In the instance of ground-floors, dry-rot will present itself if the boards are sealed down with impervious covering; the natural tendency of the moisture of the ground to rise through the boards is here retarded, and the side ventilation is not sufficiently effective to prevent the growth of dry-rot fungus.

The life of such a floor will vary with circumstances. Its dissolution will not be so rapid as when associated with artificial heat in the form of steam-pipes; but if the sub-soil be clay, and the space between the soil and the board is not great, the floor would require to be renewed every six or seven years. If the subsoil were dry in its character, and the space between the soil and the board ample, a double lease of such life might be given, but ultimate dissolution could not be unlooked for.

We have an instance before us of a new floor in a new building, such floors being covered with kamptulicon being destroyed by dry-rot in six or seven years. A second floor has been put down, and the covering discarded. The floor of an adjoining room which has not been covered with kamptulicon shows no signs of decay. The dissolution is thus clearly traceable to the use of impervious covering. The investigation of this subject brings to light the fact that impervious coverings for wood floors are to be condemned, and it affords a clue to the unhealthful character of certain dwellings, for plaster ceilings and wood floors offer no guarantee against bad or impure air from bad ground, decomposed wood, faulty drainage, etc., rising into the apartments and polluting the atmosphere breathed by the inmates.

As a reform in the building trade connected with the immediate future we may look for great attention being given to the subject of damp-courses, damp-layers, and block-paving in wood, by which the damp of the ground is prevented from rising into the interior of the building, and air-spaces beneath floorings of woods are rendered unnecessary.—*Building News.*

THE OLD ROMAN FORUM.



From Pavia, Italy.—12th Cen.

It has frequently been stated that the existing pavement of the central area of the Forum is higher than it was in the first century, and that its present level only dates from the third or fourth century A. D. This, however, is not the case: the marble plinth of the existing Rostra, part of which is still *in situ*, shows clearly that the existing paving of great blocks of travertine is exactly at the same level that it was in the time of Julius Cæsar, and probably very much earlier. The removal of the road which crossed the western end of the Forum by the Arch of Severus has at last fully exposed to view the Rostra of Julius Cæsar. Its remains show it to be very much larger and quite different in form from what had always been anticipated. In the first place it is a rectangular structure, not curved on plan, as earlier antiquaries had been led to expect from a doubtful reverse of a denarius of the gens Lollia with the legend Palikanvs. It is, however, almost certain that this coin does not show the Rostra of the Roman Forum, but has a conventional representation of some harbor with a row of ships at anchor, only the beaks of which appear. The existing remains show distinctly that the Rostra was a large platform, with no curve in its front wall, about seventy-eight feet long, and eleven feet high above the level of the Forum paving. Its end and side walls are built of carefully worked blocks of tufa, two Roman feet thick, two wide, and of various lengths; each block was neatly clamped to the next by dovetail wooden dowels. This tufa wall stands on a foundation formed of massive blocks of travertine. A great part of this wall has been removed for building material, but at the south angle it is nearly perfect, and a great deal of it remains along the whole of the front. One of the chief points of interest about this front wall is the existence of the holes by which the bronze beaks of the Latin ship (*rostra*) were fixed. Each beak was secured by two metal bolts two and one-half inches in diameter passing through the whole thickness of the wall, and they were arranged in two tiers at intervals of about four Roman feet from centre to centre; there were nineteen Rostra in the lower tier, and twenty in the upper one. These were the original beaks taken from the older Rostra by Julius Cæsar and refixed to the new tribunal. The *rostra* of the upper tier were set in the centre of the spaces between those of the lower tier. The discovery of these holes agrees with what is shown on the sculptured *plutei* which were discovered a few years ago on the north side of the Forum. A relief on one of these, representing the Emperor Trajan standing on the Rostra and addressing a crowd in the Forum, shows distinctly the beaks arranged in two tiers exactly as is indicated by the existing holes.

The whole of the tufa wall which forms the front and sides of the Rostra was lined with slabs of white Athenian marble, with a richly-moulded cornice and plinth at the top and bottom. Part of the moulded plinth still exists *in situ* at the end close by the Arch of Severus, though at that point the tufa wall, which the marble covered, has been removed. Each length of the marble plinth was very carefully fixed to the adjacent blocks of marble and also to the tufa wall behind it by strong clamps, some of iron and some of bronze, with their ends turned down and run with melted lead; and the whole marble casing of the wall was fixed in a similar way. None of the marble cornice remains in its place, but a number of pieces of it have been found scattered round the Rostra.

It is a very well-designed and carefully-worked cornice, and along its top bed a deep groove is cut, into which was fitted a low marble screen or *cancellum*, only one fragment of which exists, intended to keep people on the Rostra from falling off it. On one of the blocks this groove stops short, showing that there was a break in the screen, and this again proves the accuracy of another ancient relief, which shows a front view of the Rostra. This valuable representation occurs in one of Constantine's reliefs on his triumphal arch, in the band over one of the side archways. On this is shown the Emperor Constantine addressing the people from the Rostra, with other buildings and monuments of the Forum represented in the background, all of which can easily be identified. On this relief the low screen is shown along the greater part of the front, but in the middle there is a break, so that the figure of the imperial orator is visible at full length. Without this interesting relief it would have been difficult to explain why the groove for the *cancellum* stops short on one of the existing pieces of cornice. On one occasion this opening in the screen must have been of special use — namely, when Mark Antony exhibited to the vast crowd in the Forum the bleeding body of the murdered Julius Cæsar, who had completed the Rostra but a few months before his death. It was probably to some part of this

screen that Antony, in the following year, fixed the head and hands of his enemy, the aged Cicero, in revenge for speeches which he had delivered from this very place. —*London Saturday Review.*

THE NINETEENTH ANNUAL CONVENTION, A. I. A.

Secretary's Office, 10 Catharine St.,
Newport, R. I., August 31, 1885.

To ——: —

Dear Sir, — The Nineteenth Annual Convention of the American Institute of Architects will convene on Wednesday, the 21st of October next, in the Senate Chamber of the State Capitol at Nashville, Tenn. The sessions of the Convention to continue through both Wednesday and Thursday, October 21st and 22d.

The Committee of Arrangements appointed by the Board of Trustees, has made every effort to perfect a complete and attractive programme for both the business and social meetings. They have been greatly aided in this connection by the courteous offers of hospitality received from the citizens of Nashville.

The complete programme of exercises has not yet been perfected in all its details; but it is deemed advisable to issue at once a general circular, giving to members of the A.I.A. an idea of the scope and aims of the approaching Convention.

This outline sketch of programme is in brief, as follows:

1. An exhibit of architectural drawings and building materials in the rooms of the Art Association of Nashville. To the exhibition of drawings it is hoped that contributions will be sent by many members of the Institute.

The building materials exhibited will be such as are known to Tennessee.

2. *First Day,* Forenoon — Meeting of the A.I.A. Afternoon — Visit to some of the principal buildings in and around Nashville. Evening—Public Reception and Concert complimentary to the A.I.A. by the Art Association of Nashville.

3. *Second Day,* Forenoon—Meeting of the A.I.A. Afternoon—Visit to "Belle Meade," the famous stock-farm of General Harding. Evening—Banquet complimentary to the A.I.A. by the Art Association of Nashville.

It will also be the endeavor of the Committee to present several papers upon technical and artistic topics, to be followed by short discussions.

The second circular, to be issued about the 1st of October, will give the whole programme for the Convention in detail, with routes of travel, cost of transportation, and reduced rates for hotel accommodation at Nashville.

Appended to this circular will be found a letter from the Secretary of the A.I.A. to the *American Architect and Building News* of August 22d, setting forth the importance of the approaching convention to the interests of American architecture, together with the earnest desire of the Committee of Arrangements, and the Board of Trustees, to make it a success in every particular. The Committee trusts that you may be able to be present at the Convention, and that you will also endeavor to induce other members of the Institute to join you in visiting this, our first Southern meeting.

Respectfully submitted,

William C. Smith,
W. L. B. Jenney,
George C. Mason, Jr.,
A. J. Bloor,
Committee of Arrangements.

All letters and communications relating to the Convention will be received by William C. Smith, Chairman of the Committee, 1 Berry Block, Nashville, Tenn., or

George C. Mason, Jr., *Secretary, A.I.A.*

NOTES AND CLIPPINGS.

The Decay of Wood. — In some tests made with small squares of various woods buried one inch in the ground, the following results, says the *Garden*, were noted: Birch and aspen decayed in three years; willow and horse chestnut in four years; maple and red beech in five years; elm, ash, hornbeam, and Lombardy popular in seven years; oak, scotch fir, Weymouth pine, and silver fir decayed to a depth of one-half inch in seven years; larch, juniper and arbor-vitæ were uninjured at the expiration of the seven years.

Members for a British Academy. — Rather more than a year ago the American journal, the *Critic*, asked for the opinions of its subscribers as to the forty Americans who, in the event of the establishment of an American Academy after the model of the Académie Française, would be first entitled to become members of it. This summer an imaginary British Academy has been formed by a similar process. The forty chosen ones are: Lord Tennyson, Prof. Huxley, W. E. Gladstone, Prof. Tyndall, G. A. Sala, Mr. Ruskin, Herbert Spencer, Matthew Arnold, Sir H. Thompson, W. Black, Sir J. Lubbock, Duke of Argyll, Leslie Stephen, George Meredith, Sir Richard Owen, Cardinal Newman, Mr. Browning, R. A. Proctor, Mr. Froude, John Morely, Lord Dunraven, Henry Irving, A C. Swinburne, E. A. Freeman, Walter Besant, Edward Arnold, G. Macdonald, Justin McCarthy, James Payn, Mr. Wills, W. Morris, Prof. Blackie, Archdeacon Farrar, Baring Gould, Wilkie Collins, Lord Lytton, Prof. Skeat, Andrew Lang, Prof. Gardiner, and Austin Dobson. Some great names are conspicuous by their absence from this list, but the selection is not upon the whole an unrepresentative one, and it is particularly interesting as showing the extent to which, thanks no doubt to the cheapness of the reprints supplied to them, our American cousins pursue the study of our most modern literature. It would be well if the transatlantic appreciation of the labors of these and other living Englishmen meant proportionate remuneration to our unfortunate authors. It may be satisfactory to a writer to know that his books are read by thousands of sympathetic men and women who live between New York and San Francisco; but at present he is sadly conscious that his American popularity profits him little or nothing. The publisher who sells a reprint of "The Data of Ethics" for 10 cents does not, we imagine, contribute very largely to Mr. Herbert Spencer's income; and he must be indeed a philosopher who can find consolation for having been robbed in the fact that he has been elected a member of an academy in Utopia. — *London Daily News.*

The August Fire-Loss.— The New York *Daily Commercial Bulletin,* of September 4, estimates the fire-losses in the United States and Canada, during August, at $5,500,000. This is a decided improvement upon former records, the average aggregate of fire-loss in August or ten years past being $7,000,000. In August, 1884, the fire-loss was about $10,000,000. The *Bulletin* thinks there is ground for encouragement in so favorable an exhibit. Nevertheless the fire-losses of the year, to the end of August, foot up $65,500,000, with four months yet to hear from.

How the First House in San Francisco was roofed. — I will add a short account of the building of the first house in what is now the great city of San Francisco, for I never have seen any correct relation of it. The house was built by William Richardson, an Englishman, in 1836. It was of adobes—squares of sun-baked clay, about four inches thick, and some twenty inches, or so, square on the surface. The house was put up on a hill or rising ground, 300 yards, more or less, from the beach used as a landing. Richardson had, some years before, married into the Sanchez family. His wife was a most excellent woman, far too good for her husband, who was an idle, dilatory man, not without intelligence, but without force or decision of character. After the walls were up, rafters for a steep roof were put in place and secured with strips of raw-hide. It was Richardson's intention to cover over with tiles taken from some of the old abandoned houses at the Mission. But without doing so at once, feeling too confident of a continuance of dry weather, he put his wife, four or five children, and all his household belongings into it and began housekeeping. Unhappily, he had delayed too long with his roof; it came on squally one afternoon with rain, and the edge of night was drawing near. Richardson rushed to the beach like one frantic, and signalled for a boat. I guessed the trouble. Before he got over the gangway he called out: "Oh you see my distress! Indeed, indeed, we are all in a sad plight, for all I care for or have is exposed to the weather. Sell me or loan me some old sails to shelter us as quickly as possible." "Not another word, Richardson," I said. "You shall instantly have all the help this ship can give you." All hands were turned up, away went the men aloft, the fore and maintopsails were unbent and lowered into the launch—two boats, with the second officer and their crews, pulled with quick and strong strokes to the beach; active and willing hands, well used to handling canvas promptly covered over house and household. This was the first roof to the first house built in San Francisco; and that house stood long enough to have a history, for in after years it was used as a post-office and as a custom-house; and the first man executed by the "Vigilance Committee" was hanged from it. — *Correspondence of the New York Evening Post.*

The North Sea Ship-Canal. — News comes from Berlin that the long contemplated ship-canal from the Baltic, through Holstein, to the North Sea, is at last likely to be made. The cost of the undertaking is estimated at nearly $40,000,000, of which one-third is to be borne by Prussia, the remainder being distributed over the other parts of the German Empire. The Government is now engaged upon the details of a measure for the furtherance of the whole project, which is spoken of as a work of peace proper to be undertaken in a time of peace. The German scheme is not the first plan of the kind for facilitating communication between the Baltic and North Seas. It is now just a century since the so-called Eider Canal was opened for traffic by the Danish Government. This waterway traverses the peninsula between the port of Kiel on the east and the mouth of the River Eider on the west coast of Schleswig-Holstein — between which provinces it forms the frontier — the "canal" being, in fact, constituted for half its length of the deepened bed of the river. Projected on such an insufficient footing, the passage of the Sound, Cattegat and Skager Rack is still enforced upon all ships of more than nine feet draught sailing from or returning to the Baltic ports. It was obvious that the construction of a canal on some more commensurate scale could be only a question of time. The revenue that must accrue from the diversion of the traffic from the circuitous northern route to a short cut through the neck of the peninsula; the saving to shipping of time, risk and wear-and-tear — these considerations have been weighed by the German Government, with the result which is now shortly to be made apparent. The new waterway will make Kiel one of its termini, from which port it will run in a south-westerly direction until it debouches in the estuary of the Elbe. The distance to be traversed is about sixty miles, and the canal is designed to afford easy passage to vessels of the heaviest tonnage. Thirty years ago some 20,000 ships used to pass through the Sound annually, the dues upon which were worth $750,000 per annum to Denmark; but at a convention of fifteen of the chief maritime States, held in 1857, these dues were commuted by the payment of a lump sum of $16,500,000 to the Danish Government. The hostility with which the new undertaking appears to be regarded in Denmark is not, therefore, quite reasonable. Such a canal has been looked forward to by the mercantile marine of all nations almost as a commercial necessity; and since the absorption of Schleswig-Holstein by Germany its construction by that power has been regarded as an inevitable consequence of the political event. At the same time Denmark can hardly, perhaps, be expected to view the project with indifference; and the withdrawal of so many vessels from her much reduced coast line must be allowed to have an appreciable bearing upon her future prosperity. —*Iron Age.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

324,803. CLAMP.—Fredrick J. Bancroft, Pawtucket, R. I.

324,818. LOCK.—George B. Cowles, New Britain, Conn.

324,819. SASH-BALANCE.—Levi M. Devore, Freeport, Ill.

324,830. SASH-FASTENER.—Lee S. Garrett, Fulton, Ky.

324,841. APPARATUS FOR UTILIZING THE WASTE HEAT FROM RANGES.—William T. Holland, Brooklyn, N. Y.

324,842. SCROLL-SAWING MACHINE.—Henry L. Hopkins, Caro, Mich.

324,847. WOOD-TURNING LATHE.—William A. Kettenring, Defiance, O.

324,855. DRAWING-BOARD.—Charles N. Leonard, Indianapolis, Ind.

324,860. PROCESS OF DECORATING PAPER AND OTHER MATERIALS WITH OIL-COLORS.—Mary B. Martin, New York, N. Y.

324,874. SWING-JOINT FOR STEAM.—Horace J. Morton, Chicago, Ill.

324,883. SASH-FASTENER.—Edward T. Prindle, Aurora, Ill.

324,885. SASH-HOLDER.—Frank L. Rosentreter, Cleveland, O.

324,914. FIRE-ESCAPE.—Edward H. Bergmann, Cimarron, N. Mex.

324,915. GONG DOOR-BELL.—Rudolph R. Buehler, Philadelphia, Pa.

324,929. SUPPORT FOR STEAM-PIPES.—John Finnegan, Philadelphia, Pa.

324,941. FABRIC FOR WALL DECORATION.—John Klee, New York, N. Y.

324,943. TRANSOM-LIFTER.—Albert Langstrom, Council Bluffs, Ia.

324,971. FIRE-ESCAPE.—Richard Woolliscroft, Streator, Ill.

324,977. AUTOMATIC FIRE-EXTINGUISHER.—Chas. Barnes, Dayton, Ky.

324,989. SHUTTER-WORKER.—Jehiel C. Driggs, Newark, N. J.

324,994. METALLIC ROOFING.—Frank A. Guthrie, Gallipolis, O.

325,001. WRENCH.—John McLean, Camden, Ala.

325,010. WRENCH.—Daniel R. Porter, Revere, Mass.

325,028. LOCK.—Charles F. Veit, London, Eng.

325,032. CHIMNEY-CAP.—Jerome W. Wetmore, Erie, Pa.

325,036. COMBINED CALIPER PROTRACTOR, AND BEVEL.—Frederick W. Woodhull, Lincoln University, Pa.

325,090. WALL-COVERING.—George Jordan, New York, N. Y.

325,142. FIRE-ESCAPE.—John H. Wilson, Camden, N. J.

325,153. OVERFLOW-FIXTURE TRAP.—Frederic L. Brown, Scranton, Pa.

325,157. HANDSAW.—George N. Clemson, Middletown, N. Y.

325,160. PAINT COMPOSITION.—Platt C. Connell, Chicago, Ill.

325,172. SHEET-IRON LOCK-JOINT SPILE.—Hirom C. Herron, Cleveland, O.

325,180. FIRE-ESCAPE.—Franz Kogoschek, Hoboken, N. J.

SUMMARY OF THE WEEK.

Baltimore.

HOTEL AND STORES.—W. F. Weber, architect, has prepared plans for P. Fitzpatrick for a three-st'y brick and brown-stone building to be used as a hotel, 62' 6" x 64', and 3 three-st'y brick and brown-stone buildings, 18' x 62' each, adjoining, to be erected on Charles St., near the Falls, and to cost $25,000; August Dagenhart, builder.

BUILDING PERMITS.—Since our last report twenty-four permits have been granted, the more important of which are the following:—

S. Richmond, three-st'y brick building, s e cor. Harford Ave. and Hoffman St.

Fredk. Cook, three-st'y brick building (sq.), n s Sarah Ann St., bet. Pearl and Pine Sts.

Church of Our Saviour, three-st'y brick parsonage, s w cor. Broadway and McElderry St.

Colin Stewart, three-st'y brick stable, s e cor. North and Mt. Royal Aves.

Bernhard Link, 2 two-st'y brick buildings, e s Port Alley, bet. Lancaster and Aliceanna Sts.

W. A. Moale, 6 two-st'y brick buildings, s s Ostend St., e Light St.; and 2 two-st'y brick buildings, n s Gittings St., in rear.

Jas. P. McGovern, 2 three-st'y brick buildings, w s Aisquith St., n Preston St.

E. Berkley, four-st'y brick building, 25' x 64', s s Franklin St., w Howard St.

J. W. Stewart, 21 two-st'y brick buildings, com. n w cor. Hanover and Barney Sts.; and three-st'y brick building, n s Barney St., w Hanover St.

F. Wilkerson, 3 two-st'y brick buildings, w s Stockton Alley, bet. Edmonson and Harlem Aves.

Morgan Bros., 3 two-st'y brick buildings, n s Stockholm St., bet. Pinkney Alley and Washington Road,

Chas. F. Namuth, three-st'y brick building, w s Washington St., n Jefferson St.

Boston.

COURT-HOUSE.—Mr. John McArthur, Jr., architect of Philadelphia, will serve with the court-house commission as expert to decide upon the merits of the preliminary plans to be submitted September 16 for the new court-house.

BUILDING PERMITS.—*Wood.*—*Swett St.*, near N. Y. & N. E. R. R., mechanical, 25' x 40'; owner, Bradley Fertilizer Co.; builder, C. Tilden, Jr.

Condor St., near Putnam St., dwell., 20' x 28'; owner, William Davis; builder, Vincent McIsaacs.

Allston St., near Melville Ave., dwell., 29' x 32' 6"; owner, Arthur H. Vinal; builder, E. Shapleigh.

Allston St., near Melville Ave., dwell., 25' x 31'; owner, Arthur H. Vinal; builder, E. Shapleigh.

Adams St., cor. Malvern St., stable, 25' x 30'; owner, Mrs. W. Tileston; builder, F. M. Soverance.

Cottage St., near Clifton St., dwell., 24' x 31'; owner and builder, W. W. Dromney.

Washington St., *No.* 2478, storage, 66' x 100'; owner, P. B. Smith; builder, Peter Hutchinson.

Winthrop St., near Blue Hill Ave., dwell., 22' x 28'; owner and builder, W. H. Handy.

Armandine St., near Milton Ave., dwell., 25' x 28'; owner and builder, Ephraim Moulton.

Washington St., near Melville Ave., dwell., 40' x 40', owner, S. J. Capon; builder, A. B. Sherman.

Barnard Pl., near Barnard St., dwell., 15' x 26'; owner, Mrs. C. Jackson; builder, A. B. Sherman.

Blue Hill Ave., cor. Private Way, dwell. and store, 24' x 33'; owner, Thomas Mulhern; builder, W. V. Tent.

Rand St., s, dwell. and store, 24' x 33'; owner, Thomas Mulhern; builder, W. V. Tent.

Private Way, from Blue Hill Ave., dwell. and store, 23' x 33'; owner, Thomas Mulhern; builder, W. V. Tent.

Rand St., s, 2 dwells. and stores, 23' x 33'; owner, Thos. Mulhern; builder, W. V. Tent.

Tremont St., *No.* 1159, storage, 10' x 21'; owner, and builders, Hayward & Co.

Ashley Ave., near Ford Ave., dwell., 24' x 30'; owner, Thomas Murray; builder, Thomas Yermans.

Brooklyn.

BUILDING PERMITS.—*Fourteenth St.*, s s, 97' 10" w Sixth Ave., 9 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,500; owners and builders, John Walters & Son, 375 Pacific St.

Suydam St., s s, 319' 11" e Myrtle Ave., 2 three-st'y frame tenements (brick-filled) tin roofs; cost, each, $4,000; owner and builder, George Straub, 11 Lewis Ave.; architect, Th. Engelhardt.

Monroe St., s s, 300' w Ralph Ave., 3 two-st'y brick dwells., tin roofs; cost, total, $9,975; owner, B. A. Demill, Sumpter St., cor. Stone Ave.; architect, F. Holmberg; builder, F. Stemler.

Atlantic Ave., n e, 50' w Nostrand Ave., 4 two-st'y brick dwells., tin roofs; cost, total, $8,000; owner, J. J. Drake, 397 Fulton St.; architect and builder, J. N. Smith.

Bergen St., s s, 80' e Franklin Ave., two-st'y brick stable, gravel roof, iron cornice; cost, $2,500; owner, O. B. McAveney, 992 Bergen St.; architect, W. H. Hazzard's Sons.

Sumpter St., n w cor. Howard Ave., two-st'y frame (brick-filled) store and dwell., tin roof; cost, $3,000; owner, J. V. Hasseln, Marion St.; architects and contractors, Ames & Waldron; mason, E. Sutterlin.

Seventeenth St., n s, 225' e Fourth Ave., three-st'y brown-stone dwell., tin roof; cost, $8,700; owner, W. H. Williams, 607 Third Ave.; builder, Geo. Ingram.

Fulton St., s s, 280' e Howard Ave., three-st'y brown-stone store and dwell., gravel roof; cost, $6,-000; owner, Th. Donohue; architect, B. T. Robbins.

Fulton St., s s, 40' e Howard Ave., 9 brown-stone dwells., 8 three-st'y and 1 two-st'y, gravel roofs; cost, each, $6,000 and $4,500 for 1; owner and architect, Benj. T. Robbins, Northport, L. I.; builder, E. K. Robbins.

Moffat St., e s, 150' e Knickerbocker Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $2,600; owner, John Morrow, 1279 De Kalb Ave.; architect, H. Vollweiler.

Fayette St., *No.* 19, n s, near Broadway; three-st'y frame store and tenement, tin roof; cost, $4,200; owner, Jacob Krans, 19 Fayette St.; architect, H. Vollweiler.

Elm St., s s, 120' e Broadway, three-st'y frame (brick-filled) flat, tin roof; cost, $4,000; owner, architect and builder, H. Vollweiler, 788 Broadway.

Debevoise St., s s, 44' w Morrell St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, John Wegeman, 100 Debevoise St.; architect, H. Vollweiler.

Park Ave., s s, 90' e Nostrand Ave., three-st'y frame factory, tin roof; cost, $11,500; owner, Thos. W. Hynes, Flatbush; architect, T. F. Houghton; builders, S. H. O'Rourke and D. Ryan.

Willoughby Ave., s w cor. Hall St., 5 three-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owner and builder, Henry L. Coe, 535 Washington Ave.; architect, A. Hill.

Vanderbilt Ave., *No.* 32, three-st'y brick tenement, tin roof; cost, $5,500; owner, Mrs. Newton, 32 Vanderbilt Ave.; architect, W. M. Coots; masons, Assip & Buckley.

Hart St., s s, 100' w Marcy Ave., 4 two-and-a-half-st'y brown-stone dwells., tin roofs; cost, each, $5,-000; owner and builder, Thomas E. Greenland, 256 Kosciusko St.; architect, I. D. Reynolds.

Concord St., s e cor. Liberty St., four-st'y brick laundry, tin roof; cost, $30,000; owner, J. P. Traffe, 202 Fulton St.; architect, C. F. Eisenach; builders, T. B. Rutan and W. Zang.

Union Ave., w s, 50' s Grand St., four-st'y brick store and tenement, tin roof; cost, $10,000; owner, L. Wintgen; builders, J. Rodwell and S. Hough.

Dean St., s s, 200' w Vanderbilt Ave., two-st'y brick factory, tin roof; cost, $3,000; owners, H. Humbert & Co.; architect, R. Dixon; builder, J. Gordon.

Water St., near Fulton St., on Bridge property, two-st'y brick station, slate roof; cost, $7,000; owner, Brooklyn Elevated Railroad, 49 Fulton St.; architect, J. Mumford; builders, T. B. Rutan and E. Snedeker.

Gates Ave., n s, 25' e Marcy Ave., three-st'y brick store, tin roof; cost, $6,700; owner, John Canabez, Marcy and Gates Aves.; architect, I. D. Reynolds; builders, J. Rickard and T. Donnelly.

Decatur St., s s, 40' e Sumner Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, $14,000; owner, J. M. Brown, 527 Quincy St.; architect, A. Hill.

Marion St., s s, 125' e Howard Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $5,000; owner, Charles Schmitt, 188 Marion St.; builders, J. Pirrung and C. Horn.

Fourth Ave., e s, 25' s Twelfth St., two-st'y brick stable, gravel roof; cost, $3,500; owners and masons, Assip & Buckley; architect, W. M. Coots.

Seventh Ave., n e cor. Tenth St., 2 three-st'y brown-stone stores and dwells., tin roofs; cost, total, $12,000; owner, J. Nickenig; architect, R. Dixon; builder, L. Bonnard.

Union St., s s, 150' w Bond St., three-st'y brick dwell., tin roof; cost, $6,000; owner and architect, William Clemens, 438 Union St.

Hicks St., *No.* 475, e s, 275' s Harrison St., four-st'y brick tenement, tin roof; cost, $10,000; owner, N. H. Frost, 41 Remsen St.; architects, W. H. Hazzard's Sons.

Bedford Ave., w s, 62' n Lexington Ave., 2 five-st'y brick tenements and stores, tin roofs; cost, abt. $25,000; owner, J. M. Horton Ice Cream Co., 453 Fulton St.; architect, F. E. Lockwood.

ALTERATION.—*Bedford Ave.*, *No.* 599, new plastering and repair damage by fire; cost, $7,000; owner, architect and builder, Thomas H. Brush, 128 Flatbush Ave.

Chicago.

BUILDING PERMITS.—M. McGinnis, 3 two-st'y dwells., 997-1001 West Harrison St.; cost, $6,000; Strippleman, architect.

N. Lutz, two-st'y dwell., 857 Thirty-fourth St., cost, $2,700.

J. Tobison, three-st'y stores and flats, 2837-2839 Cottage Grove Ave.; cost, $12,000; architect, J. M. Vanosdel.

G. F. Fricke, two-st'y dwell., 3747 Walnut St.; cost, $4,500; architect, F. Ahlschlager.

J. D. Vorak, three-st'y flats, 484 Jefferson St.; cost, $5,000.

F. Suva, three st'y flats, 32 O'Brion St.; cost, $4,-300.

A. Mulinke, two-st'y dwell., 432 Lincoln Ave.; cost, $2,700.

H. M. Fox, two-st'y dwell., 3763 Ellis Ave.; cost, $3,000; architect, L. B. Dixon.

W. G. Jackson, two-st'y dwell., 937 West Adams St.; cost, $8,000.

A. D. Coleman, two-st'y addition, 2738 Portland Ave.; cost, $3,700.

L. Schutt, two-st'y flats, 119 Seminary Ave.; cost, $3,000.

O. H. Niedner, cottage, 388 West Division St.; cost, $3,400.

C. Sheer, 2 three-st'y dwells., 3406-3408 State St.; cost, $7,000; architects, Thomas & Rodger.

A. Kuh, two-st'y dwell., 3142 Michigan Ave.; cost, $10,000; architects, Adler & Sullivan.

J. Long, two-st'y flats, 351 Lincoln Ave.; cost, $4,-500.

Wm. Sims, two-st'y flats, 1142 Taylor St.; cost, $2,-800.

O. C. Walcott, three-st'y dwell., 3831 Vincennes Ave.; cost, $3,000.

H. Sweet, 3 two-st'y stores and flats, 1454-1456 Milwaukee Ave.; cost, $6,000; architect, C. Hulke.

P. Powers, two-st'y flats, 346 Polk St.; cost, $3,-500; architect, N. Provost.

M. W. Carter, two-st'y barn and milk depot, 441-446 Adams St.; cost, $3,000.

G. A. Webb, two-st'y dwell., 978 Wilcox Ave.; cost, $3,000; architect, G. A. Webb.

J. Plamondon, three-st'y flats, 461 Wood St.; cost, $3,500; architect, J. L. Leban.

T. Brennan, two-st'y dwell., 634 Ashland Ave.; cost, $3,500; architect, J. J. Flanders.

W. C. Seipp, two-st'y dwell., 2958 Groveland Ave.; cost, $6,000, architect, C. Cudell.

M. Laux, three-st'y flats, 39 Delaware Pl.; cost, $5,000; architect, J. Huber.

T. W. Wolff, shop, 302-306 Hawthorne Ave.; cost, $3,000.

F. Greenwald, two-st'y store and dwell., 183 West North Ave.; cost, $2,900.

H. Schell, three-st'y store and flats, Wentworth Ave.; cost, $8,000.

J. E. Taylor, two-st'y dwell., 2954 Calumet Ave.; cost, $18,000.

M. C. Dobbin, one-st'y addition, 267-273 Twentieth St.; cost, $3,000.

Chicago City Railroad Co., Thirty-ninth and Cottage Grove Ave.; cost, $6,000.

N. Busch, elevator, Cherry St.; cost, $12,000.

F. Furlong, two-st'y store and flats, 502 Austin Ave.; cost, $2,800.

J. H. Blair, two-st'y flats, 470 Carroll Ave.; cost, $3,500; architect, J. H. Blair.

Mrs. A. Miller, dwell., 582 Sedgwick St.; cost, $6,-000; architect, F. Berlin.

A. J. Doyle, two-st'y dwell., 500 West Jackson St.; cost, $5,500.

J. Lindahl, two-st'y flats, 451 Dayton St.; cost, $7,-000; architect, Strippleman.

Mrs. M. G. Clancy, two-st'y dwell., 3244 Vernon Ave.; cost, $4,000; architect, R. Ray.

Mrs. R. Corlett, two-st'y flats, 1008 Halsted St.; cost, $3,000.

P. O'Donnell, remodel church; cost, $10,000.

R. Herbert, two-st'y dwell., 183 Fremont St.; cost, $2,700.

Phœnix Distillery Co., four-st'y distillery, Clybourne Ave.; cost, $18,000; architect, P. J. Killen.

Dr. M. W. Cortley, 2 two-st'y dwells., 295-297 Centre Ave.; cost, $6,000.

J. Hoffman, three-st'y stores and dwells., 464-470 Ogden Ave.; cost, $17,000; architect, A. Smith.

C. L. Jenks, 8 three-st'y dwells., Clark St.; cost, $37,000; architect, J. Spyer.

T. Raymond, 3 three-st'y dwells., 303 and 305 Indiana St.; cost, $11,000; architect, E. M. Branch.

Cincinnati.

Building Permits. — William Schubert, Jr., brick building, Sumner and Gest Sts.; cost, $4,000.

Mr. Tobarke, three-and-a-half-st'y brick building, Flint and Dalton Sts.; cost, $9,000.

G. H. Plump, two-st'y brick building, Vine and Mulberry Sts.; cost, $2,750.

Wm. H. Stewart Sons, three-st'y stone building, Seventh and Walnut Sts.; cost, $4,186.50.

G. W. Vaughan, three-st'y brick building, McMillan and Kemper Lane; cost, $7,000.

B. Barr, two-st'y frame building, Hibby and Wayne Sts.; cost, $2,500.

S. Frey Sons, two-st'y brick building, Colrain Pike and Queen City Sts.; cost, $4,000.

Henry Weiman, four-st'y brick warehouse, Pearl and Plum Sts.; cost, $3,000.

D. Fischer, two-st'y brick building, Colrain Pike and Straight St.; cost, $3,000.

Steinman & Meyer, four-st'y brick building, Sixth and Linn Sts.; cost, $5,500.

H. Robinson & Co., two-st'y frame buildings, State and Liberty Sts.; cost, $3,000.

Jno. H. Meyer, two-st'y frame buildings, Glenway Ave. and Gest St.; cost, $3,000.

Permits to date, 684.

Total cost of repairs, $137,201.50.

Kansas City, Mo.

Building Permits. — William Long, three-st'y business block, 10, 12 and 14 Missouri Ave.; cost, $20,000.

Norton & Beatty, block of 6 cut-stone front houses, 1301, 1303, 1305, 1307, 1309 and 1311 East Fifteenth St.; cost, $25,000.

Almira Hayes, brick business house and dwell., cor. Forest and Independence Aves.; cost, $8,000.

James L. Withrow, brick block, East Fourteenth St.; cost, $16,000.

Edward Duffy, brick block, cor. of Fifth and Tracy Sts.; cost, $3,500.

Alice Robinson, brick house, cor. Sixth and Harrison Sts.; cost, $5,000.

A. L. Mason, five-st'y brick and cut-stone business block, 50' x 112', 1207, 1209 and 1211 Main St.; cost, $77,000.

Minneapolis, Minn.

Building Permits. — Wm. Buchlen, two-st'y wood dwell., n s Irving Ave., bet. Third Ave. and Sixth Ave., n; cost, $8,000.

Island Power Company, alteration stone factory, Nicollet Island; cost, $9,000.

J. H. Rowell & Co., two-st'y wood dwell., w s Garfield Ave., bet. Lake St. and East Thirty-first St.; cost, $4,800.

Frank Holmes, two-st'y stone veneer dwell., n e s Thirteenth St., bet. Hennepin and Hawthorne Aves.; cost, $15,000.

City of Minneapolis, two-st'y brick engine-house, s cor. Seventh Ave. and Eighth St.; cost, $9,000.

New York.

City Work. — Comptroller Loew has returned about 100 contracts to the Commissioner of Public Works without his approval of sureties, as by the late amendment of the constitution no money can be appropriated for payment of work for city improvement during the present fiscal year.

Houses. — For the Manhattan Construction Co., 14 three-and-four-st'y houses, brick, stone and terra-cotta fronts, are to be built on the n s Sixty-third St., bet. Ninth and Tenth Aves.; from plans of Mr. Wm. B. Tuthill.

On the s e cor. One Hundred and Twenty-sixth St. and Eighth Ave., 6 three-st'y and basement dwells., of brick, stone and terra-cotta, are to be erected for the Nassau Building Co., at a cost of about $60,000; from designs of Mr. A. I. Finkle.

On One Hundred St. and Riverside Ave., a house 56' x 100', is to be built for Mr. Peter Doelger; from plans of Mr. Wm. Shickel.

Herter Bros. have filed plans for 9 four-st'y brick houses and stores on Avenue A, bet. Seventy-ninth and Eightieth Sts., for Francis T. Schnugg; cost, $150,000.

Building Permits. — *Clinton St., No.* 131, five-st'y brick tenement, tin roof; cost, $18,000; owner, Tobias Krakower & Co., 86 Attorney St.; architect, Chas. Rentz.

Fifteenth St., s s, 56' e Avenue A, five-st'y brick tenement with store, tin roof; cost, $6,000; owner, Ph. Deffaa, 539 Sixth St.; architect, Wm. Graul.

West Fifty-first St., No. 542, five-st'y brick (stone front) tenement, tin roof; cost, $20,000; owners, Huston Bros. on premises; architect, C. A. French.

Sixth Ave., n w cor. Fifty-second St., 3 five-st'y and attic brick flats with stores, tin roofs; cost, total, $50,000; owner, Peter Doelger, 405 East Fifty-fifth St.; architect, J. Kastner.

East Eightieth St., No. 2, four-st'y brick dwell., mansard roof of slate, iron and tin; cost, $60,000; owner, Mrs. Sarah Weissman, 670 Broadway; architects, A. Zucker & Co.

Eighty-fifth St., n s, 98' e Avenue A, five-st'y brick tenement, tin roof; cost, $18,000; owner, M. Schneider, 419 East Eighty-first St.; architect, J. Kastner.

Eighty-eighth St., s w cor. Lexington Ave., stone front church, peak roof slated; cost, $78,000; owners, Trustees of the German Evangelical Lutheran Immanuel Congregation, present church Eighty-seventh St., bet. Third and Lexington Aves.; architect, Arthur Crooks; builders, J. D. Murphy and James Thompson.

One Hundred and Fifth St., n s, 145' e Lexington Ave., 3 five-st'y brick tenements, tin roofs; cost, each, $14,000; owner, M. H. Schneider, 419 East Eighty-first St.; architect, J. Kastner.

One Hundred and Fifth St., n s, 182' Lexington Ave., two-st'y brick stable, tin roof; cost, $5,000; owner and architect, same as last.

One Hundred and Fifteenth St., s s, 80' w Second Ave., four-st'y brick (stone front) flat, tin roof; cost, $12,000; owner and builder, John Walker, 233 East One Hundred and Thirteenth St.; architect, J. H. Valentine.

East Eighty-fourth St., No. 5, five-st'y brick flat, tin roof; cost, $25,000; owner, Augustin Walsh, 3 East Eighty-fourth St.; architect, Wm. Schickel.

First Ave., 1708 *and* 1710, 2 five-st'y brick tenements with stores, tin roofs; cost, each, $13,000; owner, Peter J. Uihlein, 355 East Eighty-seventh St.; architect, John Brandt.

Seventy-eighth St., n s, 250' w Ninth Ave., 2 four-st'y brick dwells.; and 4 three-st'y brick dwells., tin and iron roofs; cost, 2 each, $18,000, and 4 each, $14,000; owner, B. S. Levy, 110 East Seventy-fourth St.; architect, R. Guastivino.

One Hundred and Fourth St., s w cor. Tenth Ave., three-st'y brick home, slate and tin roof; cost, $57,000; owner, Home for the Relief of the Destitute Blind, C. H. Leland, President; architect, F. Carles Merry; builder, J. J. Burchell.

One Hundred and Twenty-third St., n s, 100' e Morningside Ave., 10 three-st'y brick dwells., deck roof tinned, mansard slated; cost, total, $95,000; owners, Keller & Tilford, 123 West Forty-seventh St.; architect, M. Louis Ungrich; builder, not selected.

Sixty-eighth St., s e cor. Ninth Ave., five-st'y brick tenement, tin roof; cost, $26,000; owner, David B. Algie, 432 West Fifty-seventh St.; architects, Thom & Wilson.

Sixty-eighth St., s s, 25' e Ninth Ave., 6 four-st'y and basement brick (stone front) dwells., tin roofs; cost, each, $18,000; owner, etc., same as last.

One Hundred and Sixty-first St., n s, 78' w Tenth Ave., two-st'y brick dwell., tin roof; cost, $4,000; owner, Thomas Fenton, Tenth Ave., cor. One Hundred and Sixty-first St.

One Hundred and Fifty-first St., n s, 275' w Courtlandt Ave., two-st'y frame dwell. with brick basement, tin roofs, Schmidt & Garvin, builders; cost, $4,000; owner, Christina Ludwig, 677' e One Hundred and Fifty-second St.; architects, Kramer Bros.

Washington Ave., e s, abt. 200' s One Hundred and Seventy-sixth St., 2 two-st'y and attic frame dwells., cost, $3,500; owner, Annie H. O'Brien, 1839 Bathgate Ave.; architect, J. E. Kerby.

Washington Ave., w s, 135' n One Hundred and Seventy-seventh St., three-st'y frame dwell., tin roof; cost, $3,000; owner, E. H. Flink, 1931 Washington Ave.; architect, C. S. Clark.

Tenth Ave., w s, 76' n One Hundred and Fourth St., 2 five-st'y brick tenements, flat tin roof; cost, each, $20,000; owner, Franklin Thurston, 62 East One Hundred and Thirty-third St.; architect, Theo. Thomson, n e cor. Eighth Ave. and One Hundred and Twenty-fifth St.

Broadway, Nos. 1424 *and* 1426, seven-st'y brick flat, brick and stone front, flat tin roof; cost, $110,000; owner, Daniel S. McElroy, 216 Lexington Ave.; architect, F. T. Camp, 60 Liberty St.

West Fortieth St., Nos. 623 *to* 627, three-st'y brick building, flat roof covered with gravel to be used as a slaughter-house; cost, $22,000; owner, Jerome F. Sadler, Sturtevant House, N. Y.; architects, Arford & Cramer, 333 Paroma, Jersey City, N. J.

Sixth Ave., n w cor. Fifty-second St., 3 five-st'y brick tenements, flat tin roof; total cost, $50,000; owner, Peter Doelger, 405 East Fifty-fifth St.; architect, J. Kastner, 744 Broadway.

Barclay St., No. 71, brick store building, flat tin roof; cost, $7,000; owner, Estate Geo. W. Welch, cor. Greenwich St. and Park Pl.; architect, James E. Ware, 239 Broadway.

One Hundred and Twentieth St., n s, 95' e Second Ave., 2 three-st'y and basement brick dwells., flat tin roof, brown-stone front; cost, each, $6,000; owner, John W. McSorly, 305 East One Hundred and Twentieth St.; architects, Cleverdon & Putzell, 110 East One Hundred and Twenty-fifth St.

Twelfth Ave., n e cor. One Hundred and Thirty-second St., two-st'y, store-house and refrigerator brick building, peak tin roof; owner, Thomas H. Wheeler, 448 West Thirty-fourth St.; architect, Joseph W. Norton, 403 West One Hundred and Twenty-sixth St.

East Thirteenth St., Nos. 515 *and* 517, 2 five-st'y brick tenements, flat tin roofs; cost, each, $15,000; owner, John A. Fay, 115 Second Ave.; architect, J. Kastner, 744 Broadway.

East One Hundred and Thirty-fifth St., No. 528, four-st'y brick tenement house, flat tin roof; cost, $10,000; owner, Gottleib Frick, 168 Lincoln Ave., architect, W. Thomas Beers, 429 East One Hundred and Twenty-second St.

East One Hundred and Forty-third St., No. 634, three-st'y and basement brick dwell., flat tin or gravel roof; cost, $10,000; owner, Samuel F. Pease, 710 East One Hundred and Forty-third St.; architect, John Anderson, 718 East One Hundred and Forty-third St.

One Hundred and Twenty-third St., s s, 100' e Ninth Ave., 11 three-st'y and basement brick dwells., brown-stone front, flat tin roof; cost, each, $14,000; owners, J. W. & A. A. Ticts, 208 West One Hundred and Twenty-fifth St.; architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.

Grand St., No. 225, five-st'y brick building, brick and stone front, flat roof covered with gravel; cost, $18,500; owner, Thomas S. Olleve, 107 East Sixtieth St.; architect, E. Sniffen, 317 Broadway.

Highbridge Road, 450' e Jerome Ave. (Fordham), three-st'y wood dwell., slate roof; cost, $6,000; owner, Mrs. Aurelia Murray, Fordham; architects, C. V. Folin & Son, Fordham.

Jerome Ave., n e cor. Kingsbridge Road, two-st'y frame and brick dwell., wood front, peak tin roof; cost, $5,250; owner, John D. Armstrong, Fordham; architects, C. V. Folin & Son, Fordham.

East One Hundred and Fifty-sixth St., No. 663, two-st'y and basement brick and frame building; flat tin roof; cost, $3,200; owner, Theodore Housman, 659 East One Hundred and Fifty-sixth St.; architect, Edward Stichler, 551 East One Hundred and Fifty-fourth St.

Ninth Ave., n w cor. Twentieth St., four-st'y brick dwell., peak and flat roof covered with slate and tin; cost, $30,000; owner, General Theological Seminary, 409 West Twentieth St.; architect, Chas. C. Haight, 111 Broadway.

East Fifteenth St., No. 7, five-st'y brick building, brown-stone front, peak and flat roof, terra-cotta plates and tin roofs; cost, $100,000; owners, Young Men's Christian Association, 6 East Twelfth St.; architect, R. H. Robertson, 121 East Twenty-third St.

Alterations. — *First Ave., Nos.* 1641 *and* 1643, store front, iron columns, etc.; cost, $4,000; owner, Sophia Roberts, 206 Second Ave.; architects, Schwarzmann & Buchman.

Avenue A, No. 242, four-st'y brick extension, tin roof, also new store front; cost, $3,500; owner, Philip Deffaa, 539 Sixth St.; architect, W. Graul.

Greenwich St., Nos. 170 *to* 174, chimney built upon or raised; cost, $5,000; owner and builder, New York Steam Co., 22 Courtland St.; architect, C. E. Emery.

Seventh Ave., s e cor. Fifty-first St., four-st'y brick extension, felt and gravel roof; cost, $5,000; owners, Broadway & Seventh Ave. R.R. Co.; architect, S. D. Hatch.

Fiftieth St., n s, 197' e Seventh Ave., new st'y to be added to two-st'y brick building, flat roof making same three-st'y, used as a blacksmith shop; cost, $5,000; owner, Broadway and Seventh Ave. R. R., Fiftieth St., cor. Sixth and Seventh Aves.; architect, Stephen D. Hatch, 115 Broadway.

Kingsbridge Road, 308' w Webster Ave., an extension to two-st'y wood dwell., peak roof, slate and tin; cost, $2,500; owner, P. J. Keary, 78 East Eighty-first St.; architect, Geo. H. Budlany, White Plains.

West Fifty-third St., general internal alterations to four-st'y brick dwell., flat roof; cost, $3,000; owner, Sidney Dillon, 5 West Fifty-seventh St.; architect, Manley N. Cutter, 160 Broadway.

St. Marks Pl., No. 17, general internal alteration to four-st'y brick and marble building, peak roof; cost, $3,000; owner, Rev. Jacob Freshman, 25 West Seventh St.; mason, G. H. Williams, 2 West Fourteenth St.

Broadway, s w cor. Twenty-ninth St., internal alterations to galleries of theatre peak tin roof; cost, $5,000; lessee, Geo. C. Brotherton, Philadelphia; architect, Henry J. Dudley, 1300 Broadway.

East Broadway, No. 58, extension and new st'y on two-st'y brick building, flat tin roof; cost, $4,000; lessee, David Cohen, 56 East Broadway; architect, Wm. Graul, 12 Stanton St.

Philadelphia.

Building Permits. — *Parrish St.*, cor. Holly St., 2 three-st'y dwells.; Louis C. Smith, owner.

Firth St., w Eighth St., 2 three-st'y dwells.; Thos. Battely, owner.

Firth St., w Eighth St., 2 two-st'y stables; Thos. Battely, owner.

Richmond St., cor. Vienna St., two-st'y dwell.; Thos. McCaulley, contractor.

Chester Ave., cor. Springfield St., 2 three-st'y dwells.; Thos. D. Antrim, owner.

Denmark St., w Front St., 2 two-st'y dwells.; Jno. M. Creane, contractor.

Fernon St., e Nineteenth St., 10 two-st'y dwells.; Thos. Grimman, owner.

South Fifteenth St., No. 730, three-st'y dwell., 16' x 85'; Robt. Lamona, owner.

Delaware Ave., n South St., ferry-house, 77' x 86'; Kaignspoint Ferry Co.

Hope St., Nos. 2131 *and* 2133, 2 two-st'y dwells., 17' x 30'; Wm. Bartholomew, contractor.

Kohl St., w Trenton Ave., two-st'y dwell., 21' x 28'; Wm. Bartholomew, contractor.

Hartwell St., w Kensington St., 3 two-st'y dwells., 16' x 45'; Jos. Hamilton, owner.

Wishart St., n s, w Frankford Road, 2 two-st'y dwells., 15' x 30'; Jos. McNutt, contractor.

Snyder Ave., e Thirteenth St., 2 two-st'y dwells., 16' x 40'; M. Whelan, contractor.

South Eighth St., No. 754, three-st'y dwell., 17' x 45'; A. Lagomarsine, owner.

Ann St., No. 153, two-st'y dwell., 14' x 30'; S. Hein, owner.

Catharine St., e Front St., two-st'y dwell., 15' x 40'; J. P. McGougal, owner.

Alaska St., w Fifth St., 3 two-st'y dwells., 14' x 30'; H. Sherlock, contractor.

Jefferson St., near Mercer St., 5 two-st'y dwells., 15' x 35'; J. D. Caldwell, contractor.

Ludlow St., w Thirty-seventh St., stable and carriage-house; C. W. Budd, contractor.

St. Louis.

Building Permits. — Seventy-five permits have been issued since our last report, nineteen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

S. A. Sharp, two-st'y frame dwell.; cost, $3,000; Alex. M. Kechnise, contractor.

Henry Waushaffe, two-st'y brick dwell.; cost, $3,500; Henry Waushaffe, contractor.

Mrs. Yeilitch, two-st'y brick dwell.; cost, $3,200; J. B. Legg, architect; S. L. Jones, contractor.

J. Pichar, two-st'y brick dwell.; cost, $2,500; Wm. Ihlo, contractor.

Chas. F. May, 2 adjacent two-st'y brick dwells.; cost, $5,000; C. F. May, architect; sub-let.

P. B. Fenske, two-st'y brick dwell.; cost, $3,300; E. Janssen, architect; Wm. C. Popp, contractor.

Shattinger, two-st'y brick dwell.; cost, $5,000; E. Janssen, architect; Wm. C. Popp, contractor.

F. Coester, two-st'y brick dwell.; cost, $4,350; E. Janssen, architect; Wm. C. Popp, contractor.

C. Supp, three-and-a-half-st'y store and tenement; cost, $3,000; R. Doerste, contractor.

Alex. Duncan, one-st'y brick addition; cost, $5,000; J. B. Fitzgibbons, contractor.

Mrs. J. D. Edwards, two-st'y brick dwell.; cost, $6,000; J. W. Hertel, architect; Francisco & Farnum, contractors.

H. Niehaus, two-st'y brick store and tenement; cost, $5,000; H. Stauder, contractor.

M. Obermeyer, 2 adjacent two-st'y brick tenements; cost, $4,000; F. Giser, contractor.

G. Wollbrink, 2 adjacent two-st'y brick tenements; cost, $3,200; F. Giser, contractor.

J. Dummeyer, two-st'y brick dwell.; cost, $2,500; J. Dummeyer, contractor.

M. Slattery, 3 adjacent two-st'y brick tenements; cost, $5,000; Sanith, contractor.

Henry Miller, 2 adjacent two-st'y brick tenements; cost, $4,000; P. Riechers, contractor.

Henry Miller, 2 adjacent two-st'y brick tenements; cost, $4,000; P. Riechers, contractor.

George W. Monroe, 2 adjacent two-st'y brick dwells.; cost, $6,000; J. W. Hertel, architect; G. Kunch, contractor.

E. P. Dickson, 2 adjacent two-st'y brick dwells.; cost, $2,500; Dickson, contractor.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. No. 508.

SEPTEMBER 19, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE competition for the State Capitol of Colorado has resulted in the choice of a design by Mr. E. E. Myers of Detroit, the architect of the Texas State Capitol, now in process of construction, and of the Capitol of Idaho, at Boisé City. The designs placed next in order were by Messrs. F. E. Edbrooke of Denver, and Mr. Herman B. Seeley. Bids are to be invited at once for the execution of Mr. Myers's design, and if the cost is found to exceed one million dollars his plans will be laid aside, and Mr. Edbrooke's will then be put to the same test. Mr. Myers's estimates have, however, been carefully made, and it is not probable that his design will be superseded. His description of the building, as contained in the book of specifications submitted with the plans, is reproduced in full in the Denver *Tribune-Republican*, and although we disapproved the terms of competition, and felt that the architects who accepted those terms were doing an injury to themselves and their profession, we acknowledge without hesitation that the careful study of this document has increased the respect with which Mr. Myers's Texas design had already taught us to regard him. All through the paper we find evidences of correct taste, appreciation of the requirements of such a structure as a State Capitol, and skill in providing for them, which merit high praise; and as we read we are more and more astonished that a man of so much ability should hold his talents so cheap as to lavish them on such ill-paid and thankless work as the construction of the Colorado Capitol upon the terms proposed. We imagine that Mr. Myers, whom we suppose to be an ambitious and comparatively young man, is now too much elated over his victory to care much about the character or consequences of the struggle; but we believe that before many years he will find himself reflecting with regret upon the part which he has taken in it. Not only will he feel, we think, that he has wasted a considerable part of the best period of his life in work which he could not afford to bring to a perfection worthy of his capacity or advantageous to his reputation, but he will also realize, unless we are much mistaken, that he might, if he had chosen to demand it, have obtained the same remuneration, as well as the same opportunities for studying his work, and the consequent reputation and extended connection, which the best architects of other countries enjoy; and that his hesitation in doing so has not only served to deprive him of rewards which may never again be within his reach, but has, by associating his name with those of the ignorant and unscrupulous horde of "cheap architects," inevitably, although unjustly, deprived him of much of that fair fame which, we may assume, he has tried so hard to deserve.

MRS. ALICE LE PLONGEON writes a curious account, published in the *Scientific American*, of some villages of pygmies discovered by her husband and herself on the eastern coast of Yucatan. It is singular that recent ethnological discoveries in various parts of the world have related to dwarf tribes, and Mrs. Le Plongeon, before describing the Lilliputian towns of Yucatan, reminds us that a number of stone tombs were found a few years ago on the banks of what the printed account calls the River Merrimac, containing adult human skeletons only three feet long, and it is probable that the colonization of Central Africa will show the existence of many tribes of little men. In Mexico, particularly in the south, the dwarfs play a large part in the traditions of the natives, who attribute to them the construction of the ruined buildings found there, and sometimes profess to have seen them, or to have been disturbed by the sound of their hammering at night. The place most frequented by the dwarfs seems to have been Cozumel Island, a low, flat reef, about twenty-four miles in length, off the east coast of Yucatan. On this island still exist the ruins of pygmy cities of considerable importance, with temples built of carefully-hewn stone, the largest of which is fourteen feet long and nine feet high, and has a doorway three feet high and eighteen inches wide; and near by are well-constructed triumphal arches nine feet high. On the neighboring coast are still to be seen the remains of villages, all the houses in which are of stone, but so small that no one larger than an ordinary child of two years could comfortably get into them. There is some reason to suppose that the little race still survives. According to the Indian guide who led Dr. and Mrs. Le Plongeon to the ruins, and who professed to have seen the dwarfs frequently, they are very small and quite shy, appearing only at night, with large hats on their heads, and never speaking to those whom they meet. Many of our readers are old enough to have seen the "Aztec children," the diminutive specimens of a race supposed to be extinct, which were exhibited about the country twenty-five years ago; and it is not impossible that the remnant of tribes which occupied the country long before the Toltec conquest may be found in the valleys of the Cordilleras, just as representatives of nearly all the ancient European races are found still existing in the remoter Alpine valleys.

EVERY suggestion relating to the deposition of metals in veins in the rocks has a certain importance as tending to give greater certainty to the efforts of miners to find these veins. At present, the science of mining, particularly for the precious metals, is almost a lottery. If gold or silver is suspected to exist in a given place, shafts are sunk there, and if veins of metal are cut by the shaft, they are followed up by lateral excavation, until they either become so slender that the metal obtained from them does not pay for the labor of extracting it, or are cut off entirely by a fault in the strata. In many cases the shaft fails to intercept a vein, and laterals must then be run at random until ore is reached, or the attempt is abandoned. The common theories of the formation of metallic veins give the miner little help in searching for them. It is evident enough that they come in some way from the infiltration of liquid or dissolved minerals or metals into fissures in the matrix rock, but the art of finding fissures so occupied, or the sources from which come the precious substances which fill them, is as yet very little developed. In fact, geologists are far from agreed as to whether metallic veins are filled from above, by slow deposition from solutions, or from below, by volcanic action, which forces metallic ores, either melted or dissolved in water or gas, into the available crevices, and leaves them there to solidify. The fact that the interior substance of the earth is far heavier than the solid crust, and must, apparently, consist almost entirely of melted metal, gives some support to the latter theory, but many other circumstances oppose it, and as sea-water is found to contain all the metals in small quantities, the theory that most metallic veins have originated in some way from the separation of the metals from water is perhaps the most popular.

OF late, however, a new theory has been put forward, which seems to combine the plausible features of the other two. This theory, which appears to be due to Professor Sandberger of Wurzburg, and is described in *La Génie Civil* by M. Ernest Chabrand, is known as the Theory of Lateral Secretion, and regards the deposit of metallic ores in veins as the result

of a gradual percolation of water through the matrix rock, which in his opinion, always originally contained the metallic particles, although the process of lixiviation may have been so complete as to wash all trace of them out of the rock itself into the fissures. In certain cases, where the rock, after the formation of the veins, has been subjected to the violent action of water, the whole mass has been ground up and carried away, to be deposited as alluvium somewhere else, but even in such cases the proportion of metallic particles in the alluvium, increasing in particular directions, usually shows the original position of the rock from which it was derived. With the object of ascertaining whether primary rocks carrying metallic veins retained in their substance any trace of the metals forming the veins, Professor Sandberger made careful analyses of different crystalline rocks, and found in them, in small proportion, nearly all the elements concentrated in their veins. The analysis of sedimentary rocks containing metallic veins, which was carried on at the same time with the investigations of Professor Sandberger by M. Dieulafait, Professor of Geology at Marseilles, confirmed this theory, although it introduced some curious observations. In most cases the stratified metal-bearing rocks showed plainly enough the sources from which all their components were derived, but in some instances the metals contained in them must have been dissolved out of the primary veins, and precipitated from the solution by a new agent. The most striking example of this was found in a copper ore from Mansfeld, which occurs disseminated irregularly in a bituminous schist. The schist is full of fossil fishes, and is overlaid by a deposit of limestone, and this by gypsum which is saturated with rock salt. M. Dieulafait considers that in the formation of this deposit the copper was originally dissolved by sea-water out of veins in the primary rocks still existing in the neighborhood. Afterwards, perhaps by the retreat of the sea, leaving an isolated lagoon exposed to the sun, the water in which the copper was dissolved began to evaporate, the mixed solution of copper and other minerals becoming more and more concentrated as the water escaped. By and by the fish began to die, and the reaction of their decomposing bodies on the gypsum dissolved in the water set free sulphuretted hydrogen, or some similar compound, which precipitated the copper in the state of sulphide, in which it still remains. The deposits of copper vary in thickness with the proportion of fossil bones under and about them, so that M. Dieulafait's explanation of their formation is apparently the correct one, and the bituminous infiltration of the schist perhaps represents that portion of the decomposed flesh of the fishes which remained after the volatile elements had escaped. Although the paragraph does not continue the description, it is easy to account for the subsequent changes in the salt-water lake. After the water had become so concentrated as to kill the fish, and precipitate the dissolved copper in an insoluble condition, to mix with the organic matter which covered the sandy or clayey bottom of the pool, the other substances dissolved in the water began to crystallize out, as evaporation proceeded, in the order of their solubility. First came the lime, which settled in fine crystals over the sediment at the bottom until it had all separated; then the gypsum, which is far more soluble than carbonate of lime, crystallized out; and when the last vestige of water disappeared from the lake, the salt remained behind.

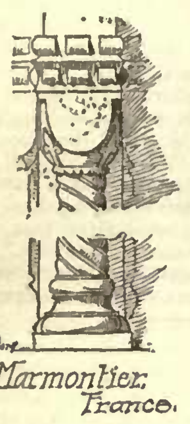
THE theory that the water existing in the pores of the rocks possesses sufficient activity to dissolve out metals and carry them into the fissures is so reasonable that it is strange that no one should have thought of it before. As architects well know, all stones in a natural condition contain a greater or smaller amount of "quarry sap," which is always saturated with dissolved minerals. Even the hardest granite contains about a pint of water to the cubic foot of stone, and most rocks contain much more, and it is natural that the moisture should acquire, by the combined effect of gravitation and capillary attraction, a movement which in course of time might produce great results. In some granite quarries, where the stone lies in "sheets," as if by imperfect stratification, it is observed that the spaces between the sheets are usually filled with enormous crystals of quartz and felspar, as if the water, soaking through the upper layer of granite, had dissolved the components of the stone, and carried them down to the vacancies between the superimposed masses, to build them up there, by slow evaporation, into the large crystals which such a prolonged and quiet process usually yields; and it is well known that the foot of an exposed trap dyke, like the Hudson River Palisades, is often rich in precious stones, perhaps formed in the same way from material dissolved out of the rock above. The whole subject is full of interest. To take a single example, the city of Philadelphia is built on a clay so rich in gold that the value of the metal contained in the stratum, within the city limits, is estimated to exceed the whole valuation of the city which stands upon it; and as, according to the new theory, all this gold must have been washed from the primary rocks of some place not far distant, it would be worth while, perhaps, to look for that place, and see if any of the precious dross still remains.

AS will be seen by the letter published elsewhere, a number of the best-known architects in New York and other cities have done the public a service by addressing a letter to the committee for the erection of a monument to General Grant, pointing out the best method of securing the most satisfactory design for the costly memorial which it is proposed to erect. It is needless to say that in this matter the wishes of the committee, the public, and all professional architects and artists are entirely in accord. Each of them wishes to see the great American honored by the most beautiful and noble monument that it is within the power of American art to produce; and as architects know better than any one else how good designs for such structures can be, and are procured in other countries, and know also the fatal effect of the mistakes which committees, inexperienced in the ways of professional artists, and ignorant of the necessary conditions of good artistic work, generally make in this country, it is in every way befitting that the representatives of the profession should endeavor to forestall the possibility of another of those grotesque failures which have so conspicuously marked the history of art in this country. That the warning should have come in season is not the least of its merits. As all architects know, lay committees with matters of art in charge are apt to be rather proud of their unaccustomed burden, and to resent any advice as an unwarranted interference with an affair which they feel themselves perfectly competent to manage. The attempt to devise, out of the plenitude of their own wisdom, methods for obtaining designs, generally results in suggesting to such committees, for the first time, vague doubts of their own omniscience; but, rather than humiliate themselves by admitting that any one else knows more of the subject than they do, they promulgate such terms of competition as they have been able to concoct, condoning their rashness with the thought that if everything should not go right they will take pains to rectify any mistakes later. Unfortunately, however, as any architect could tell them, the last opportunity for rectifying mistakes is past when the programme of terms is printed and sent out. These terms form a valid contract between the committee and every person who accepts them by doing any work in accordance with them; and the committee cannot vary, amend or depart from them thenceforth in the smallest degree without making its members individually, as well as the committee in its official capacity, liable to be called upon to pay every person who had taken any trouble in accordance with the original terms a fair price for the time and skill so occupied, as well as compensation for any damage or inconvenience which the change in the stipulations might have caused him. As no committee can face the possibility of this, all thought of improving the terms affecting the designs is, as soon as the risk is explained, at once abandoned, and the only safe course, that of the rigorous fulfilment of the conditions, is necessarily pursued to its final result of ridicule, disgust and disappointment. How many scores of times this familiar drama is enacted every year, only architects know, and, reluctant as all of them are to interfere with other people's duties, it was a wise and patriotic spirit which prompted the professional signers of the letter to endeavor, for once, to prevent its repetition on a conspicuous scale.

THE judgments on the designs for the Prize of Rome have just been published in Paris. M. François André, pupil of M. André, has carried off the grand prize, by means of the best design for a building intended for a medical college. The second prize is awarded to M. Devienne, pupil of Messrs. Coquart and Gerhardt, and the third to M. Louvet, pupil of Messrs. Ginain and Louvet.

STROLLS ABOUT MEXICO.[1] — VII.

THE GRAND PLAZA AND THE CATHEDRAL.



THE great central plaza of Mexico, the focus of the life of the capital, is named the Plaza de la Constitucion. It is also called the Plaza de Armas, military plaza, or parade-ground. The national palace, which with its broad and low façade, occupies one entire side of the square, has in front a large open space, paved with flattish cobble-stones. Here every morning at nine o'clock a roll of drums and blare of bugles is heard as a battalion of the regular army is inspected. Formerly the whole plaza was open, and it must have presented a vacant and barren aspect. The charming garden called the Gócolo, which now occupies the centre, was one of the few good results of Maximilian's reign. The example here set has been followed throughout Mexico; a notable instance of public spirit and love of the beautiful which prevades the people, and of how quickly good seed, once sown, will bear fruit. I have been in no town in the republic not adorned with these pretty plaza gardens, with flowers, shrubbery and fountains, and often some monument or piece of sculpture given by a generous citizen. The contagiousness of the example is the more remarkable from the isolation in which nearly all Mexican centres of population have stood until the recent building of thousands of miles of railway, and even now some of the chief cities have scores of leagues of wilderness between them and kindred civilization.

The interest of the plaza is historic, monumental, picturesque and spectacular. Let one stand here and ponder on the past, and the most romantic associations of the continent will throng the brain. Pictures of a gorgeous aboriginal civilization that, but for its arrest, might have developed in one of the most favored of earth's fair places, a peculiar bloom of its own perfection; of adventure, conquest and heroism; of the building of a powful kingdom under the sway of the viceroys; of stately fortunes, stately titles, and stately palaces founded upon the treasure-fertile mountains of New Spain; of a more than half-century struggle against tyranny, first of monarchy, and then of the church; of the last endeavor to raise the standard of royalty in the new world, and finally, of the powerful wave, bearing the spirit of the nineteenth century, sweeping over the land. From this small spot diverges a grand perspective.

The great architectural feature of the Plaza is the Cathedral, the most prominent building in the city and the largest church edifice on the continent. It is a building which grows upon one, and improves with familiarity. The first impression which it gives is apt to be more of breadth than loftiness; it seems too wide-spreading, and it is not until one passes inside that its truly impressive height is realized. The towers are, indeed, very far apart; a fact which one notes in even a distant view of the city from the southern or northern suburbs. The sense of this defect wears away under the influence of more positive qualities of excellence. That which it has in abundance compensates for that which it lacks. This afore-mentioned fault, which is its greatest, proceeds from its ultra sturdiness. Its proportions are gigantic, with its strikingly broad base it has the expression of a firm, inflexible intent; it has grown up in the spirit of its beginning, and has an indomitable, immovable quality, inheriting, I fancy, something of the personality of its predecessor, the great sacred pyramid temple, the Teocali of the Aztecs. But with all its attributes of permanency it has something in its air, its deportment, so to speak, that suggests adaptability rather than the sternness which might be looked for in keeping with these qualities. And this strikes me as a reflection of the adaptability of the church, which domesticates and moulds itself to the conditions of the locality where it may be.

The concentration of adornment in the façade and about the side portals, and the carrying it up with increasing richness with the towers, a characteristic which, as I have observed in previous articles, contributes largely to the effectiveness of most ecclesiastical architecture in Mexico,—lend themselves in this case with even more than ordinary felicity. The great façade is exceptionally broad, offering a wide field for enrichment. This is utilized to the best advantage, and, the plain bases of the towers being almost cubes, their blank surfaces not carried so high as is customary, opportunity is given for the central ornamentation to diffuse itself as it rises, with a lateral sweep, in the broad series of six double, buttressing scrolls. The adornment, though rich, has a wise self-restraint, and in no part has it the vagueness or confusion so difficult to avoid under such circumstances. The arrangement of details is such as to give each part its proper emphasis and accord it a harmonious place in the scale. The balance, the adjustment of parts to the whole, is admirable. The towers have a simple richness which could hardly be better in its way, as manifested in the lower belfry with the symmetrical group of arched openings in each face, four minor flanking one major; and in the upper belfry with its octagon enclosed in a square. The enormous bell-shaped caps are faulty features. They are oppressive, and they terminate the towers too abruptly. Had their dwarfed circular bases been carried up into third belfries, proportional in height to the two lower, and then allowed to terminate more lightly, it would have added vastly to the beauty of the structure, giving it a grace and aerial character which it now lacks, and atoning, with its increased height, for the too ample breadth.

The sculptured details, the reliefs and the statues, are, like most sculpture in similar positions, difficult to examine closely. It is, however, the best work of the kind in Mexico. Much of it has an individual delicacy and beauty. The group of Faith, Hope, and Charity surmounting the clock has the flowing, symmetrical curves of the best Renaissance.

The Sagrario, or Sacristy, which adjoins the Cathedral on the east, is a type of the worst Rococo, and, with its confused mass of broken, meaningless lines, contrasts, in its unrest, with the chaste dignity of the cathedral. Its good proportions and excellent dome redeem it, however, from badness.

The cathedral was begun in 1573, a church which succeeded the Aztec Teocali in 1530 having been demolished to give place to it. The Aztec temple was dedicated to the war god Mexitili, or Huitzilopóchtli, and was about one hundred and fifty feet high. It was, according to the descriptions of the conquerors, a truncate pyramidal structure, built in successive stories, each of which was reached by a flight of steps whose ascent was gained only by passing around the entire pyramid. There were one hundred and fourteen of these steps. The cathedral was finished in 1667, at a total cost of something like $2,000,000. It is four hundred and twenty-six feet long, two hundred feet wide, and its towers are about two hundred feet high. Like the National Palace, it occupies an entire side of the Plaza. Pictures almost innumerable have been made of it, but I have never seen anything which gives so complete an idea of the magnitude and dignity of the structure as does the photograph which furnished the original for our illustration.

The interior is magnificent and imposing in its proportions. No other church in North America so nearly approaches the vast and spacious effect of the great European cathedrals. Unfortunately, as in several other Mexican cathedrals which I have seen, there is no view of the whole length of the nave, the great organ with an enclosing choir standing in the body of the church near the entrance. The whole length can only be seen in the aisles, and these lack the height of the nave. Another feature, peculiar to Mexican cathedrals, is the lane which leads from the high altar down the centre of the church to the central altar and the choir. This is for the processions, giving them freedom of movement which would be prevented by the crowds which throng the place on great occasions. This lane is bounded by a bronze balustrade so rich in gold and silver that it is said that an offer to replace it with one of equal weight in silver was refused. Its weight is stated to be twenty-six tons. Though the cathedral was despoiled of its most costly treasures at the time of the war of the Reformation, some of its valuables were retained, including this railing. These treasures are said to have amounted to millions, and the high altar was called the richest in the world. A golden statue of the Assumption, ornamented with diamonds, cost $1,090,000, it is averred. A beautiful Murillo, once in the cathedral, is now in possession of the Archbishop. The elaborate carving and heavy gilding of the altars and the choir represent enormous outlay. The gilding is apparently unalloyed gold, intensely yellow, and correspondingly gorgeous in effect.

The cathedral seems like an old friend which I have summered and wintered—if the expression may be used concerning that around which the seasons vary so slightly. I have seen it under so many conditions that I feel on intimate terms with it. It was seldom that my daily walks did not take me past its portals. An effective approach is that through the great avenue of the Cinco de Mayo, the Fifth of May, named in honor of the battle of Puebla, in which the Mexicans defeated the French. This is a new street, planned by Maximilian, but only completed in 1883. In character it resembles the Avenue de l'Opéra in Paris, the columned façade of the great Teatro Nacional closing the western vista, and the west tower of the cathedral rising at the other end. I remember one magnificent spectacle when standing about midway of the avenue one evening at the time of the famous red sunsets. Above the theatre roof there rose in the west the dark mass of the mountains of La Cruz in sharpest silhouette against a carmine glow like that of a conflagration. Opposite, the great tower reflected the radiance, its whitish mass steeped in the tenderest roseate tint against the purplish blue of the eastern sky when night had fully come.

Another memorable spectacle was that of September 16, when the avenue was dedicated, as a feature of the celebration of the national independence day. The avenue was garlanded with evergreen, festooned from poles set along the curbs, and at night these garlands were thickly hung with paper lanterns. Rows of tapers glittered along the ledges of the cathedral front, sides and towers, and within the cavernous recesses of the belfries green and red Bengal lights alternated, thus in combination with the steady white light that bathed the exterior forming the national colors. These lights changed rapidly from tower to tower and belfry to belfry in varied succession, and against them the great bells that occupied the openings stood in dusky outlines. It was a night like those which we frequently also have at the North in mid-September, when it seems as if, over the world, there prevailed a truce between summer and winter. The rainy season was nearly over and the night was soft and mild as seldom it is at the altitude of Mexico. The air was absolutely still.

[1] Continued from page 78, No. 503.

The plaza was filled with a sea of thousands and thousands of people. There was no disorder, no jostling, no unseemliness. Here and there in this sea were little islands of vacancy, occupied by pitch-pine fires over which Indians were cooking savory concoctions and selling them to hungry peasants, or where little mountains of peanuts—the favorite edible of the Mexican holiday crowd—were for sale. At the four corners of the garden bouquets of fireworks were incessantly corruscating and flocks of rockets were taking their flight aloft. Around the paths of the Zócolo, listening to the music, promenaded throngs of the gentry, to whom the peasantry tacitly yielded precedence, nor ventured to assert their democratic privileges, the natural feeling of deference to social superiors preventing them more than would the strictest rule. Above, the smoke hung motionless in the still air, ruddy with the reflected glow of the fires and diffusing the brilliance of the myriad lights in an atmosphere of enchantment.

On moonlight nights the cathedral gained a new beauty, the lines being softened and the heavy masses lifted into a spirituality which the edifice lacks under the prosaic daylight. Under such conditions the Sagrario is all beautiful; its charm of proportion speaking for its full value, while the unmeaning lines and confused shapes of its ornamentation are transmuted to an indefinite frostwork of silver, deliciously stippled with irregular shadows. I remember a picturesque sight one New Year's eve when crowds of Indians were sitting around in the cathedral yard waiting for the stroke of midnight and chanting their monotonous songs in low tones while the full moon poured its light from directly overhead.

A pleasant garden occupies what is called the *átrio* of the cathedral, in front and on the west side. The turf is perpetually soft and green and flowers are always blooming. Among the plants are a great number of the striking cactus-forms peculiar to Mexico. Here, too, is an engine-house where the water is pumped for the hose with which the garden is sprinkled during the dry season, the old-fashioned aqueduct system preventing the distribution of water over the city under pressure as yet, although there is a project for a new supply which may advantageously be brought from the surrounding mountains. This engine-house is concealed beneath a pile of lava, over which are trained vines and cactus: when the engine is running the smoke from the cone completes the resemblance to a miniature volcano. The flower-market, occupying a large iron pavilion near the west entrance of the cathedral is one of the morning sights of the city, with bouquets of great beauty and cheapness sold by Indians from the neighboring villages. At the corner of the garden is a striking group of Aztec relics, fragments of the Teocali, excavated on the spot. An architect would note with some interest the accuracy with which the stone of these relics is hewn, the trueness of the lines, the grace of the curves, and the form of the capitals in these fragments, among which are some grotesque images, including a toad with a human head in its mouth, and a huge coiled serpent. Near by, at the base of the west tower, is the famous Aztec "calendar stone," the subject of many learned dissertations, in the presence of which one may ponder whence was derived the accurate astronomical knowledge which enabled the Aztecs to calculate their calendar with the same exactness which we possess today, and which made the conquerors marvel how it was that in that respect the despised barbarians were far ahead of contemporary Europe. The stone was placed in its present position in 1790 by request of the commission of the cathedral. It is eleven feet eight inches in diameter, and is said to weigh twenty-six tons. It was quarried in the suburb of Coyoacan whence it was brought to the city in 1479 with great festivities, in the reign of Axayacatl. The stone is basalt.

A tasteless feature of the *átrio* garden, almost vieing with the Cogswell fountains of Boston and elsewhere in badness is a fountain presented to the city by the proprietors of the American circus, which is one of the permanent features of the amusements of the capital, and whose ugly structure disfigures the neighborhood of the east side of the cathedral, to the especial prejudice of the beautiful monument to the eminent cosmographer, Enrico Martinez, the work of the sculptor Noreña.

The cathedral leans perceptibly to the westward. There are few buildings of great size in Mexico which are not out of plumb, notably so being the Church of La Profesa, the National Library, which was formerly the Church of San Augustin, and the Minería, or school of mines. This is owing to the nature of the foundation. Mexico has sometimes erroneously been said to be built upon piles, like Venice. Although the soil is seemingly marshy, and so porous as to admit the waters of the adjacent Lake Téxcoco, which underlie the city, it nevertheless supports some of the heaviest buildings in Mexico, which would sink out of sight in a really boggy ground.

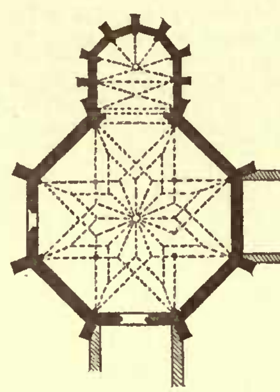
Above the clock, between the towers, there rises a tall staff, from which on holidays there floats the standard of the Republic, green, white and red, with the Aztec coat of arms, emblem of the dominance of the government over that which formerly dominated it. The government now owns the cathedral and allows the Church to use it. This reminds me of an incident of the period when the Liberals had gained the ascendency in the government, and the Church had not learned its place under the new order of things. I was at the theatre one evening with a Mexican friend, when a young man in one of the boxes was pointed out to me as Gustavo Adolofo Baz, a rising poet and dramatist. "His name indicates, I should say, that his parents were hardly devout children of the Church," I remarked.

"You are right," said my friend. "Just after the Reform his father was governor of the Federal district. It was the custom, on Ash Wednesday, for the governor to go to the cathedral and receive the key to the place where were kept the vessels for the holy sacrament, the bishop hanging it around his neck by a golden chain, and the governor keeping it until the end of the week. In accordance with this custom Governor Baz went to the cathedral at the regular time, but the bishop refused to give him the key, saying that he would not get it back again if he gave it to him. The Governor went away, saying that he would see about that. He shortly returned at the head of a body of troops, before whom he rode on horseback into the cathedral door, through the multitude which thronged the place, directly up to the high altar where he seized the bishop and all the priests in the midst of their sacred functions, packed them into the diligences which he had had drawn up in waiting at the door, and sent them down to Vera Cruz where orders were given that they should be sent to Europe by the first steamer that left the port."

That was a subject for an operatic scene worthy of Meyerheer!

Sylvester Baxter.

PRAGUE.[1] — II.


Plan of the Carlshof Church, Prague.

On the left bank of the Moldau, scarce a trace of mediæval Prague remains save the bridge towers and various structures on top of the Hradschin. The whole *Klein-Seite* has been more than once swept away and rebuilt, and now its aspect is entirely Renaissance and Baroque. What chiefly strikes us is the immense number of huge private palaces. They tell a true tale of the pomp and wealth of Prague and its nobility during the later seventeenth and the earlier eighteenth centuries; that is, between the close of the religious wars and the opening of the great struggle between Austria and Prussia. But the Bohemian nobility now makes its chief home in Vienna, and almost all the palaces are shut up and disused, though not as yet very often turned to other purposes. Yet Prague must by no means be conceived of as one of those towns, too frequent in Germany, for instance, which are mere half-dead survivals of an earlier epoch; on the contrary it strikes us as being quite peculiarly alive. It is one of the busiest and most cheerful looking of cities in its modern burgher phase; and one of the richest, too, according to the evidence of its recent buildings. We see very plainly that it is still the capital of a prosperous nation, though no longer the home of court and aristocracy.

The many palaces give the *Klein-Seite* an especially strong southern accent which is enhanced, furthermore, by the frequency in other structures of arcaded lower stories. The great deep arches round themselves, the massive piers stretch out their toes and brace their burden on the sloping streets and squares, and the shadows and the loungers lie under and around them in a truly Italian fashion. Even the swarming soldiery look southern; are slip-shod and unworkmanlike in appearance as compared with their northern rivals, but much more graceful and picturesque and, apparently, much more at leisure to display their qualities.

We may make a short cut to the top of the Hradschin if we will. But as it must be made on foot and by steps two hundred and three. It is as well perhaps to choose the more circuitous route and approach the *Burg* from behind, through westward spreading streets and squares. We find it to be an immense agglomeration of palaces, running out into a medley of narrow streets and churches and fortifications, everywhere built up to the very verge of the cliff, and on the side remote from the town, looking over into the wide tree-planted hollow which was once the moat.

The outermost western wings of the palace, enclosing three sides of a great court-yard, were built by Scamozzi in a Doric-Renaissance fashion in 1614. There are two other large court-yards and endless other wings, some earlier, some later; the latest dating from the time of Maria Theresa. Two immense state apartments were re-decorated by Ferstel in 1868 in a pompous, white-and-gold, orthodoxly regal, late-Renaissance way; and we may at least say of them that they are well fitted for their purpose. But we are more interested in the mutilated wing that was built about 1550; that is, just at the moment when Gothic and Renaissance modes were struggling together in this part of the world. Nor could the struggle be more apparent to the eye. The greatly defaced and partly concealed exterior is thoroughly Renaissance in character with large square windows divided by pilaster-mullions and some still lingering traces of delicate ornamentation; but the interior of the chief apartment (where, we are told, not only festivities of pedestrians but also tournaments on horseback were accommodated) is Gothic in all save these windows, having a fine vaulted ceiling ribbed with the bough-like or "stump" tracery characteristic of the expiring phase of German pointed-work. I have never seen anything so hideous as its present "decoration." Not even the crudest colors in the most finikin modern patterns, or the most glaring pictures of the current restorer could equal this effort (which was made, I should guess, some fifty years ago) with its

[1] Continued from page 124, No. 507.

design of simulated tracery executed on an enormous scale in gray and black upon a whitewash background. From this piece of ruined stateliness we seek the staircase which leads up to the famous *Kanzlei-Zimmer*, a square, large but low room which still fortunately preserves much the same look it must have had when the imperial governors were pitched from one of its windows in 1618, and the signal then and there and thereby given for the Thirty Years' War. Not only to the historic mind but to the tourist eye as well is this the most satisfactory corner of the *Burg:* long may the hand of the restorer be averted from it! And the outlook it affords from the very verge and corner of the Hradschin is so bewilderingly lovely that we cannot but sigh to think of the three gentlemen who lost their sense of it in their (not fatal) tumble into the ditch some fifty feet below. This practical and positive, yet picturesque and symbolic way of disposing of one's enemies seems to have been a local fashion; — there is more than one other window in Prague of which a similar tale is told.

The oldest of several towers which survive from the Hradschin fortifications is the former dungeon, called the "Black Tower," a plain, square construction of the thirteenth century. Near it we are shown the spot which was the official slaughtering-place for criminals of noble birth — a phrase which condenses into portable shape a great deal of characteristic local history. The other towers are now divided into dwellings for the poorer classes. There are also convents and private palaces and all sorts and kinds of other structures crammed together on the Hradschin. Among its churches the most important after the cathedral is St. George's. It is a much mutilated but still unrestored and therefore still decipherable small Romanesque basilica partly of the eleventh, they say, but chiefly of the twelfth century. Its towers, which stand near the east end and form the transepts, are simple enough and look time-worn enough to deserve their date. Inside we find a nave now vaulted but once flat-roofed, and galleried aisles, the vaulting of which is original. The supports are alternately piers and columns, with the simplest cube capitals. The choir is raised so that one ascends as many steps to reach it as one descends to reach the crypt, where the workmanship is of a still simpler and ruder sort. There are several very early tombs in the church but they have been restored out of all knowledge, and the entire church is threatened with a similar fate.

The cathedral, as I have said, is but a fragment. The choir is finished westwards by a temporary wall, and forms in itself so spacious a church that one imagines there can be no actual, devotional need for the completing processes now under way beyond it. The designer of the church was a Frenchman, Matthew of Arras, whom Charles the Fourth brought home with him from Avignon. But most of the work was done under his successor, a Suabian, Peter von Gmünd, called Peter Parler — a name pleasantly suggestive of a familiar friend of our trans-Atlantic infancy. And the architecture plainly corroborates what history says: the design of the choir with its beautiful polygonal apse, and with aisles and chapels following the circuit, could not be called aught else but French; but German taste and a later period are clearly shown in the outline of the supports, in the absence of capitals and in the rather flat vaulting with its net-like design. The interior has been partially restored, but not very badly, and is full of interesting monuments. The most conspicuous is the enormous sarcophagus of solid silver, with life-size angels and endless massive accessories which was a Rococo tribute to St. John Nepomuc. More delightful, however, is the Chapel of St. Wenzel, an early local ruler, which is curiously lined with semi-precious stones, set in a rough non-mechanical way. Their bright, yet mellow tints — purple, and green, and red, and yellow — form a rather barbaric but still delightfully decorative effect. Higher up on the wall are the remains of early frescoes, with figures of more than half life-size, that once must have been most exquisite, and are even now enjoyable. They are given a Bohemian authorship, but look as though an Italian hand had wrought them. Altogether the interior of this chapel which is more properly an isolated room, is an admirable subject for the water-color painter, whom I have already advised to bend his steps towards Prague.

The new work on the cathedral — the work of building the great five-aisled nave — is pretty well advanced though it will be some time yet ere the choir wall can be removed, and new and old be joined together. The tower also is to be finished and matched with another.

Peter Parler's fame rests on much wider and firmer grounds than his partial execution of the Frenchman's design for this cathedral. His hand is to be traced in many of Bohemia's finest structures, and where not the hand itself then at all events its influence. To him must largely be attributed the very French character of much Bohemian work, and to him also constant eccentricities or audacities of structure which prove him to have had a very marked architectural individuality. We can see as much without leaving the circuit of the capital where he was especially active. For his is the magnificent bridge — sixteen arches, with a total length of sixteen hundred and twenty feet — still in a singularly unmodified condition; his are several interesting churches, now mostly desecrated or restored; and his above all is the Carlshof Church, which I should call the most interesting thing in Prague.

The Carlshof is an ancient convent, away off up the river in the *Neu-Stadt*, not far from the Wyscherad hill. From the parapet of its garden we see the town from the opposite point of view to that which we held on the Hradschin, and from such a distant point that the great *Burg* with its cathedral seems but a spot against the sky. Immediately below us are steeply sloping vineyards, and in the near middle distance a long succession of mutilated Gothic churches which we may be content to see from here as most of them are now disused and access to their interiors is very difficult. The Carlshof is now an almshouse, and one registers a vow that if ever brought to pauperism one will at least earn money enough to come to Prague and be a pauper here. It is not only the garden and the view, but the paupers' actual quarters which make us envious; long, wide low-studded rooms built for monastic uses in the last century, and to-day as clean and pure and comfortable looking and as prodigal of their shadowy spaciousness as even the most querulous of ancient invalids could ask.

But all architectural interest centres in Peter Parler's church. One wonders a little how he ever thought of building it, and wonders more how he ever put his thought into stone. For it is not a church of any ordinary pattern, but a great octagon, rather more than twenty-five metres in diameter, and vaulted in a clear sweep, and in the most beautiful star-like design, to almost exactly the same height above the floor. The boldness of the dome is all the more astonishing when one notes how slight is the buttressing, and how far from massive are the walls themselves. A section of the church would show the vault to be somewhat flat, as we might expect from the date of its completion — 1377. But it does not strike the eye as being in the least too flat, differing in this respect from most German structures of the time, including Peter's own cathedral, which was finished some eight years later. Unless I am greatly mistaken there is no dome of the kind in Europe so wide as this. It is certainly a masterpiece of construction, and no less a masterpiece of beauty. And it would be such even without the splendid color which adds a final charm. Here for once we may actually see and not imagine how superb a great polychromatic pointed vault may be. The decoration dates, I believe (though I cannot just now make sure on indisputable grounds) from about 1500, and seems to have been but little touched by later vandalism.[1] The general effect is of red and gold in sombre yet brilliant richness. The red has been the background for figure-subjects, distinct yet broken traces of which may still be followed; and the gold comes in the shape of broad *repoussé* leaves of metal which are laid along the vaulting ribs as though branching from them on either hand. One wonders whether the effect in its original freshness could have been at all too loud and bright; decides most probably *not*, and yet is quite content to see the dome as it is to-day. For it does not look time-worn, only time-mellowed; not faded or scarred, only subdued. It still glows and gleams and vibrates, and is altogether the most enchanting thing of the kind that one need hope to see.

Unfortunately the walls are not in so good a condition as is the vault. The long, narrow single lights which are set far above the floor have lost almost all their glass; under them rises a row of great tawdry Baroque altars; and the wall-spaces that these leave visible were disfigured at some uncertain date with very dreadful nondescript patternings. But the hand of time has worked valiantly here while working tenderly above, and the gaudiness and tawdriness have been faded into a comparatively inoffensive condition. I should note, of course, that a polygonal apse opens from one side of the octagon — else even bold Peter Parler could hardly have made a church of it; indeed is something more than an apse: it is two parallel bays of a choir with a *four*-sided polyglon beyond; an arrangement which brings a pier and not a window in the centre, and gives still another proof that Peter was nothing if not unconventional. Yet the design is very lovely, its delicate slenderness contrasting effectively with the wide, stately sweep of the great octagon itself. But in the choir and apse, alas! the restorer has lately been at work; has covered the walls and vaulting with a little diaper of crudest tints; has set up a great light-wood reredos of that hard, dry elaboration which even among moderns only a German seems able to produce; and has framed in this the loudest and most garish of paintings. We turn with an almost affectionate eye to the softened Baroque intrusions in the body of the church, and hear with consternation that they are soon to disappear. For within a few months the restorer is to complete his work; is to purge the structure of all incongruous additions, and then to add his own. All, the custodian says, is to be very thoroughly done, and the result will be eminently "*stylvoll;*" which being interpreted, means: will be just like the choir. "But the ceiling of course will not be restored?" "Oh no, of course not; we know how beautiful it is; it will only be freshened up a bit, and retouched where necessary." And, in short, he who would see one of the finest and most individual things in Europe had better make no long delay. The Baroque trappings and the general forlornness of the lower walls will not greatly afflict him, I say, for the structure is intact, and the great graceful vault sheds glory enough to cover all inharmonious details of a time-softened kind, and to blend the whole interior into a general effect of gorgeous gloom. But modern discords are not so easily obscured; — and does not danger threaten even the dome itself?

[1] I cannot even make sure of the exact dimensions of the church. The custodian says the diameter of the vault is 25 metres, or a fraction over 81 English feet; a local handbook (which I found to be untrustworthy on other points) says 23.7 metres, or 72.2 English feet; and Lübke says 75 feet, which means more than the same measure in English, whether we interpret him to reckon with the Leyden foot, commonly used in North Germany, or with the local Prague foot. In any case the vault is considerably wider than the oft-described one of similar design on the octagonal chapel at Bathala in Portugal, which is buttressed, furthermore, by its encircling chapels. And the famous octagon in Ely Cathedral measures but 65½ feet in the clear. This last fact I note, of course, not as comparing structures essentially dissimilar, but merely to give an idea of the size of the Carlshof construction. The Ely octagon is vaulted with wood. There is, I am told, an excellent monograph on the Carlshof church, but alas! in the Bohemian language.

Fame is unjust at times. When so many far inferior things are so loudly trumpeted, why does the world not know more about this pearl among structures, this jewel bit of decoration? Of course to the architectural world it is not unknown; but it deserves a popular fame as well.

Whether the exterior of the church is to be rejuvenated or not, I do not know, nor what was its original state. It was ruined long ago and the present low dome which seems to follow very closely the curve of the vault within, was added late in the last century. Other external feature there is none save the plain outline of the apse, and the building might well be passed unnoted amid the myriad monuments of Prague. The interior was carefully measured and drawn last year by some English architects officially sent out for the purpose; but by whom or with what exact object I could not learn. Our *cicerone* averred that they came at the express personal command of Queen Victoria. The act would certainly have been fitting, for it is a royal piece of beauty.

A recent illustration in these pages having shown a Flemish church which contains a copy of the Holy Sepulchre at Jerusalem, I will add that such reproductions or attempts at reproduction are not uncommon in Europe; and that there is one connected with this very church. We enter it through a low pressure in total darkness, and by the light of flickering kerosene are shown a tiny, mouldy dismal cavern, its various niches adorned with the most infantile frescoed histories, and filled with wax-work representations of sacred incidents. How good a claim it has to structural accuracy I cannot say.

M. G. van Rensselaer.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

CHURCH OF THE EPIPHANY, WINCHESTER, MASS. MESSRS. RAND & TAYLOR, ARCHITECTS, BOSTON, MASS.

This is a small parish church recently completed at a cost of about $4,500. The exterior is shingled, and stained with Cabot's oil of creosote in harmony with the rustic stone chimney and the picturesque surroundings. The interior is finished in cypress. The roof is supported by semicircular trusses built up of several thicknesses of boards bent into position,—a mode of treatment which gives the interior a singularly broad and airy effect. The seating capacity is about 200, easily increased to 300 by throwing up the large doors into the guild-room.

COTTAGE FOR F. W. OLIVER, ESQ., ST. LOUIS, MO. MESSRS. RAMSEY & SWASEY, ARCHITECTS, ST. LOUIS, MO.

The first story will be of St. Louis pressed-brick, the second story of red slate and the roofs of black. The house is thirty-four feet by forty feet, and will cost about $6,000.

THE CATHEDRAL OF MEXICO.

For description of this building which is reproduced from a photograph by W. H. Jackson & Co., of Denver, Colo., see the article "Strolls about Mexico" elsewhere in this issue.

DESIGN FOR A GATEWAY TO EAST ROCK PARK, NEW HAVEN, CONN., BY MR. A. H. HOWE, JR., NEW HAVEN, CONN.

MISSION CHAPEL OF TRINITY CHURCH, NEWARK, N. J. MR. C. A. GIFFORD, ARCHITECT, NEWARK, N. J.

This chapel was built about two years ago at a cost of $2,500.

SEMI-DETACHED HOUSE, MT. AUBURN, CINCINNATI, O. MR. BRUCE PRICE, ARCHITECT, NEW YORK, N. Y.

SUGGESTIONS AS TO A COMPETITION FOR A MONUMENT TO GENERAL GRANT.

New York, September 10, 1885.

To the Chairman of the Committee for the Erection of a Monument to General Grant: —

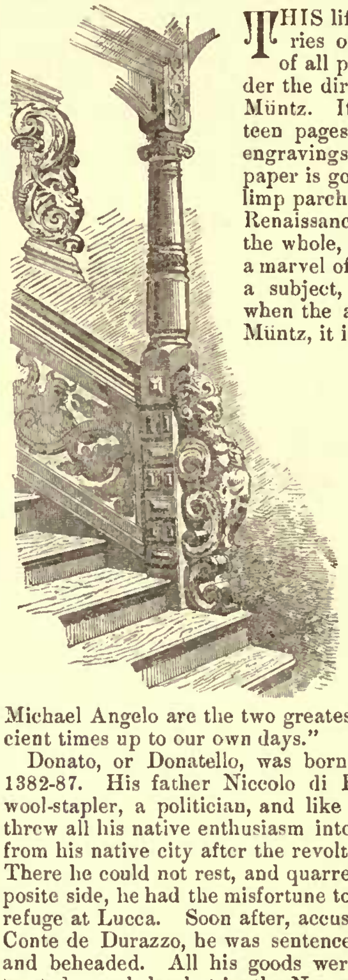
Sir,—It being manifest that the design for the monument to the late illustrious General, Ulysses S. Grant, should represent the best architectural talent the country can produce, we the undersigned architects do respectfully suggest:

1. That there should be a competition for the same.
2. That the American Institute of Architects be invited by the Chairman of the Committee to send to him the names of ten members of the profession in this country, whom it considers best qualified to make an appropriate design for the monument.
3. That the ten architects, so selected, be invited to enter into a competition for the monument with the understanding that the programme for the competition shall be prepared by a Committee of not less than three of their number, and that each of the ten be paid a certain sum of money, say, $1,000.
4. That the competition shall be open to every architect desirous of sending in a study.
5. That the order of merit of the whole number of designs submitted, be voted on by each member of a Committee of twenty, composed of ten to be nominated by the Monument Committee, and of the ten selected architects, and that the design receiving the largest number of votes, shall be accounted first, and its author employed to carry out the work.
6. That prizes of the value of say $1,000 and $500 be awarded to the best designs prepared by architects not specially invited to compete.

Albany, N. Y.
Robert W. Gibson.
Boston, Mass.
Van Brunt & Howe,
Arthur H. Dodd,
Peabody & Stearns.
Chicago, Ill.
W. W. Boyington,
Burnham & Root,
W. L. B. Jenney.
Hartford, Conn.
George Keller.
New York.
Charles W. Clinton,
James M. Farnsworth,
H. Edwards-Ficken,
H. J. Hardenbergh,
George E. Harney,

New York,
Francis H. Kimball,
Carl Pfeiffer,
William A. Potter,
R. H. Robertson,
Rossiter & Wright,
W. Wheeler Smith,
Richard M. Upjohn,
Vaux & Radford,
James E. Ware,
Weston & Tuckerman,
Frederick C. Withers.
Philadelphia, Pa.
Charles M. Burns,
T. P. Chandler, Jr.
Providence, R. I.
Stone & Carpenter.
Washington, D. C.
William M. Poindexter.

DONATELLO.

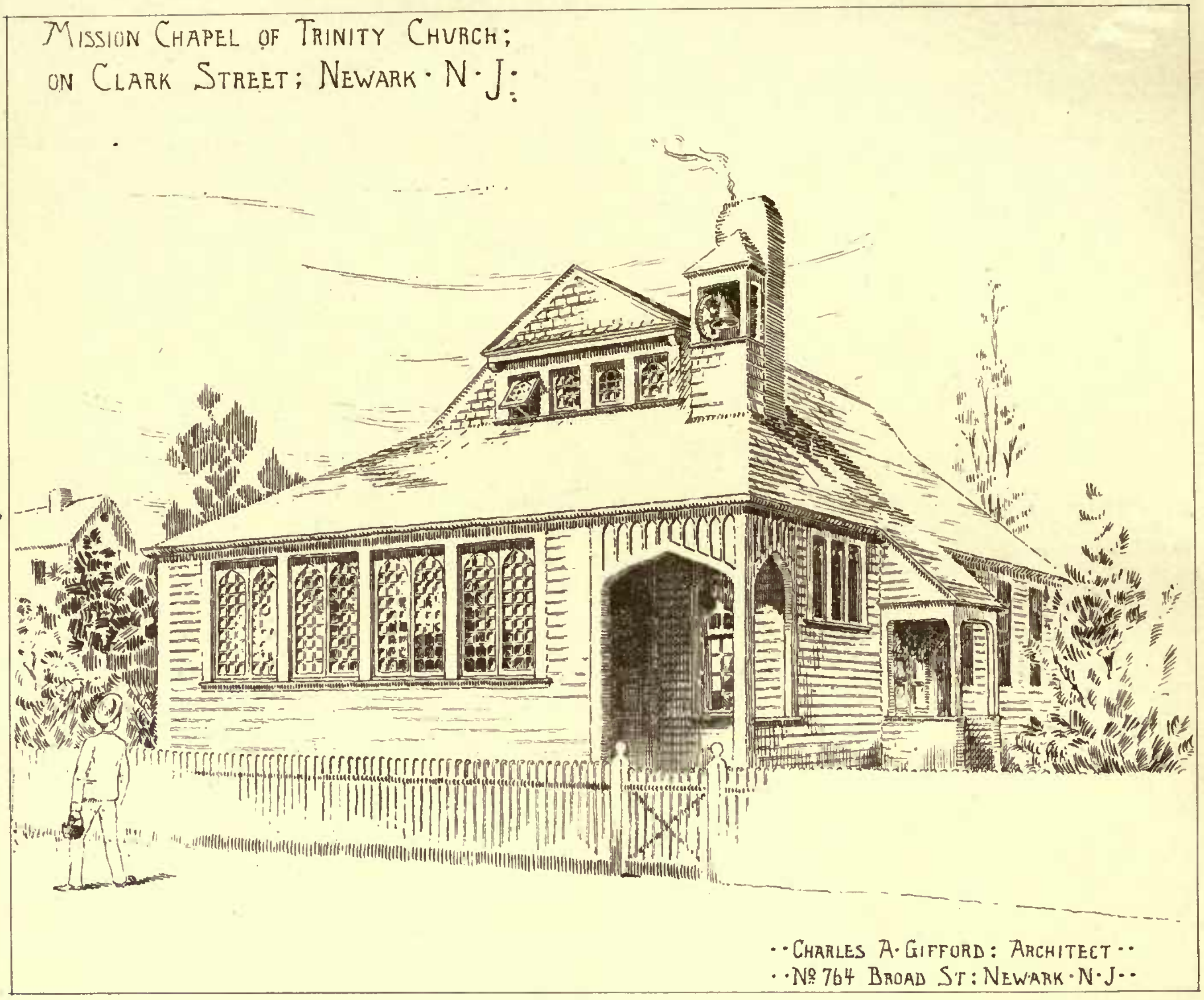


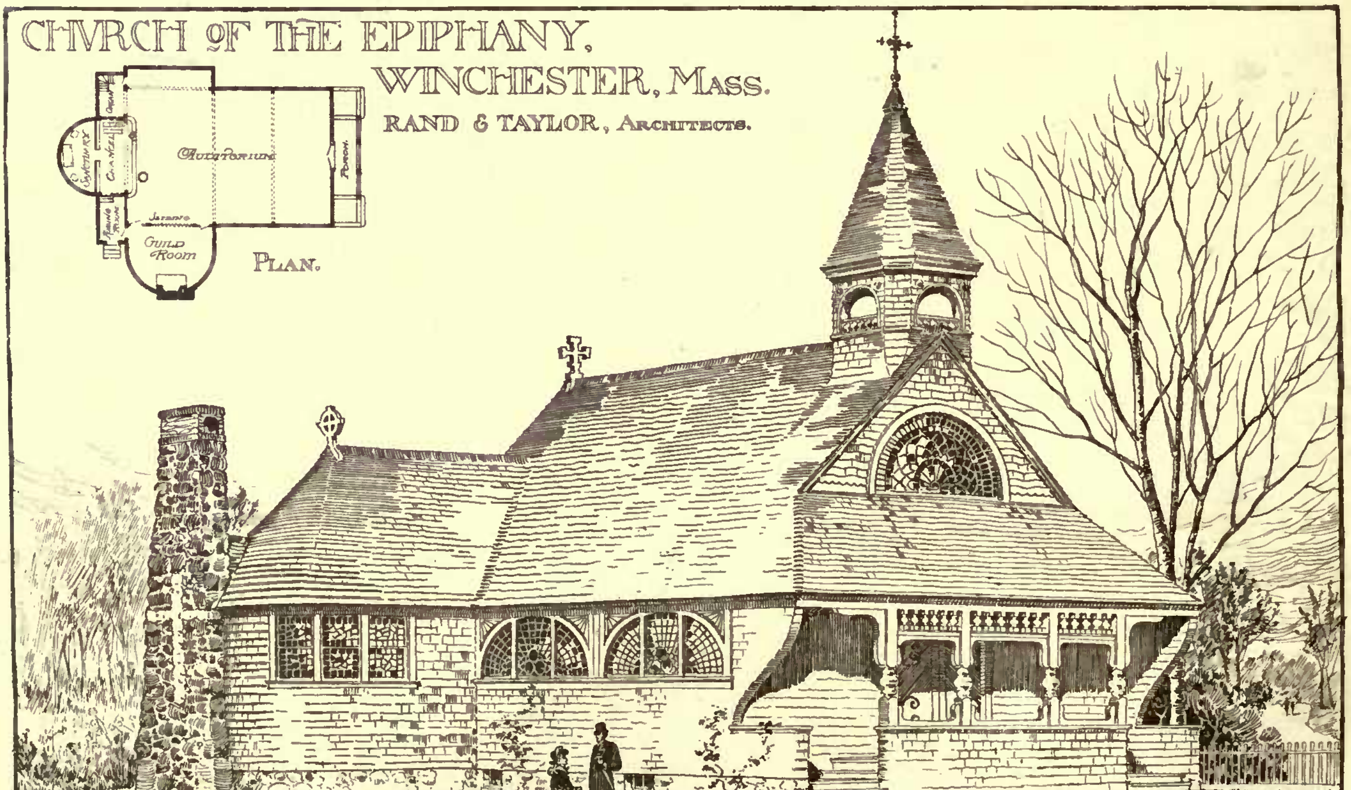
This life of Donatello is the first of a series of "*Lives of Celebrated Artists,*" of all periods and countries, published under the direction of the learned author, M. Müntz. It comprises one hundred and fourteen pages, and is illustrated by forty-eight engravings of rather unequal merit; the paper is good, the printing clear, the cover, limp parchment, decorated with a border of Renaissance design in the best possible taste, the whole, large octavo, costing five francs—a marvel of cheapness. Such a book on such a subject, must always be welcome; but when the author is so able a writer as M. Müntz, it is naturally more so.

M. Müntz justly points out in his preface, that whereas the fame of Michael Angelo has been acknowledged for the last three hundred years, it remained for this generation to recognize and to appreciate fully the genius of Donatello. The author is as enthusiastic an admirer of the man as of the artist. He calls him the "most modest, the most disinterested, the most devoted of men;" and cites the words of Benvenuto Cellini in his praise—"the great Donatello and the marvellous Michael Angelo are the two greatest men who have existed from ancient times up to our own days."

Donato, or Donatello, was born at Florence between the years 1382-87. His father Niccolo di Belto Bardi, was, besides being a wool-stapler, a politician, and like all the Italians of that day, he threw all his native enthusiasm into the cause he advocated; exiled from his native city after the revolt of the "Ciompi," he fled to Pisa. There he could not rest, and quarreling with a compatriot of the opposite side, he had the misfortune to kill him, and was obliged to take refuge at Lucca. Soon after, accused of being an accomplice of the Conte de Durazzo, he was sentenced to be attached to an ass's tail and beheaded. All his goods were confiscated, and his children treated as rebels; but in the November of the same year (1380), he was declared innocent and re-instated in his rights. The young Donatello had no taste for politics, but his spirit was revolutionary, and he inherited the excitable nature of his father. Like most of his compatriots, he began life in the workshop of a silver-smith. Vasari alludes to a work executed by him under the painter Lorenzo di Bicci (1350–1427), and as he was enrolled in the guild of St. Luke, it is quite possible that he may have studied painting. But Vasari must be in error when he stated that Donatello was one of the competitors for the doors of the Baptistery, for he was only fifteen years old at the time, and it is not probable that a youth of that age would have been allowed to enter the lists with such men as Quercia, Brunellesco and Ghiberti. But the result of the competition affected Donatello indirectly; for when Brunellesco, unsuccessful and dissatisfied with his work, determined to go to Rome to complete his studies, Donatello resolved to accompany him. This was the turning point in the life of Donatello, and the commencement of the Renaissance movement; the rigidity of the Middle Ages was thrown off (and with it, it must be confessed, a certain amount of religious sentiment) and the study of Nature and of the antique revived. Such a realist was Donatello at this period, that his friend Brunellesco accused him of making the Christ which he carved for the Church of Santa Croce, "a mere peasant." Donatello replied, that it was easy to criticise, but not so easy

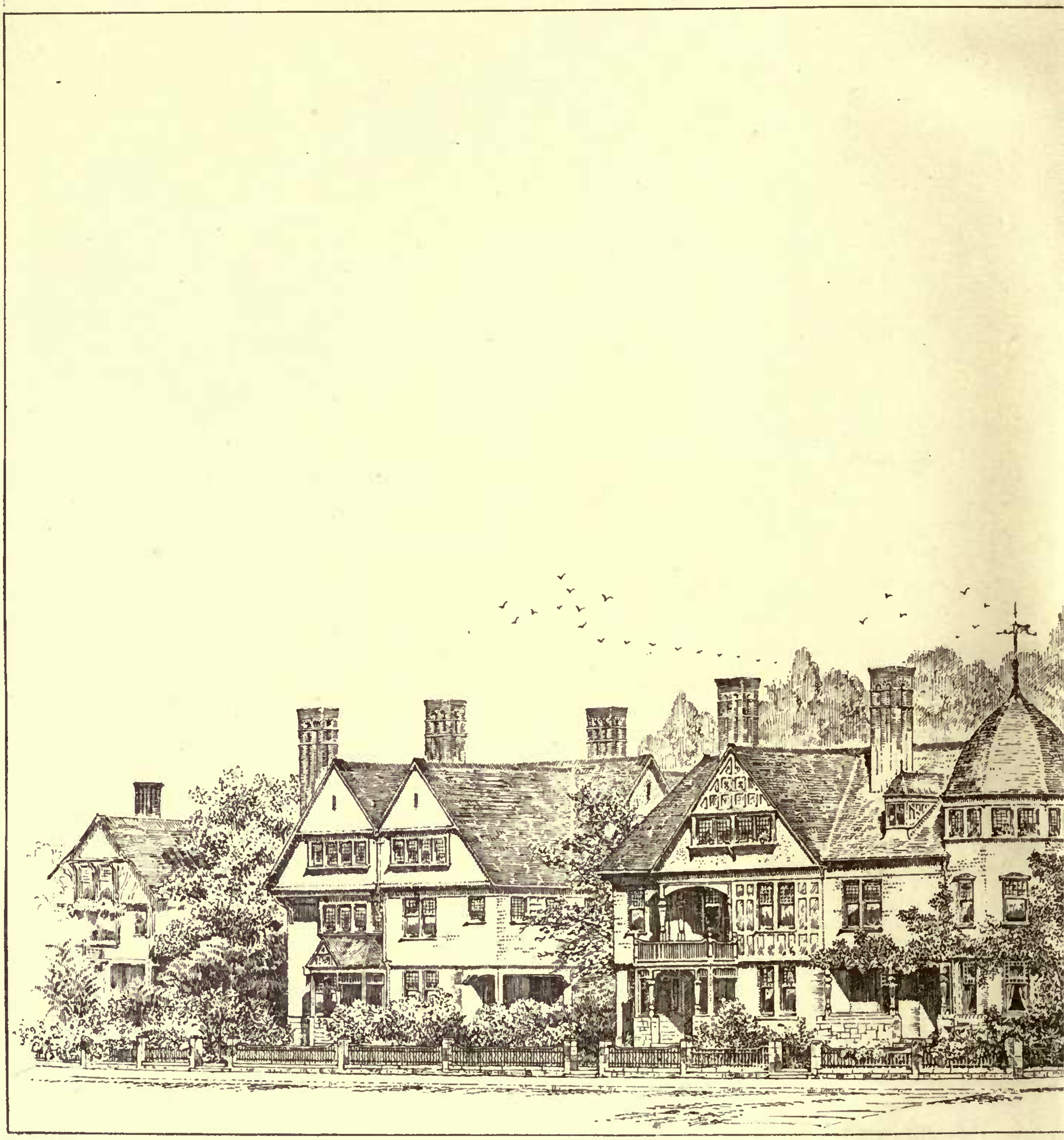
[1] "*Donatello,*" by Eugène Müntz, conservateur de l'Ecole des Beaux-Arts, Paris. I. Rouam, 20 cité d'Autin.





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AMERICAN ARCHITECT ANI



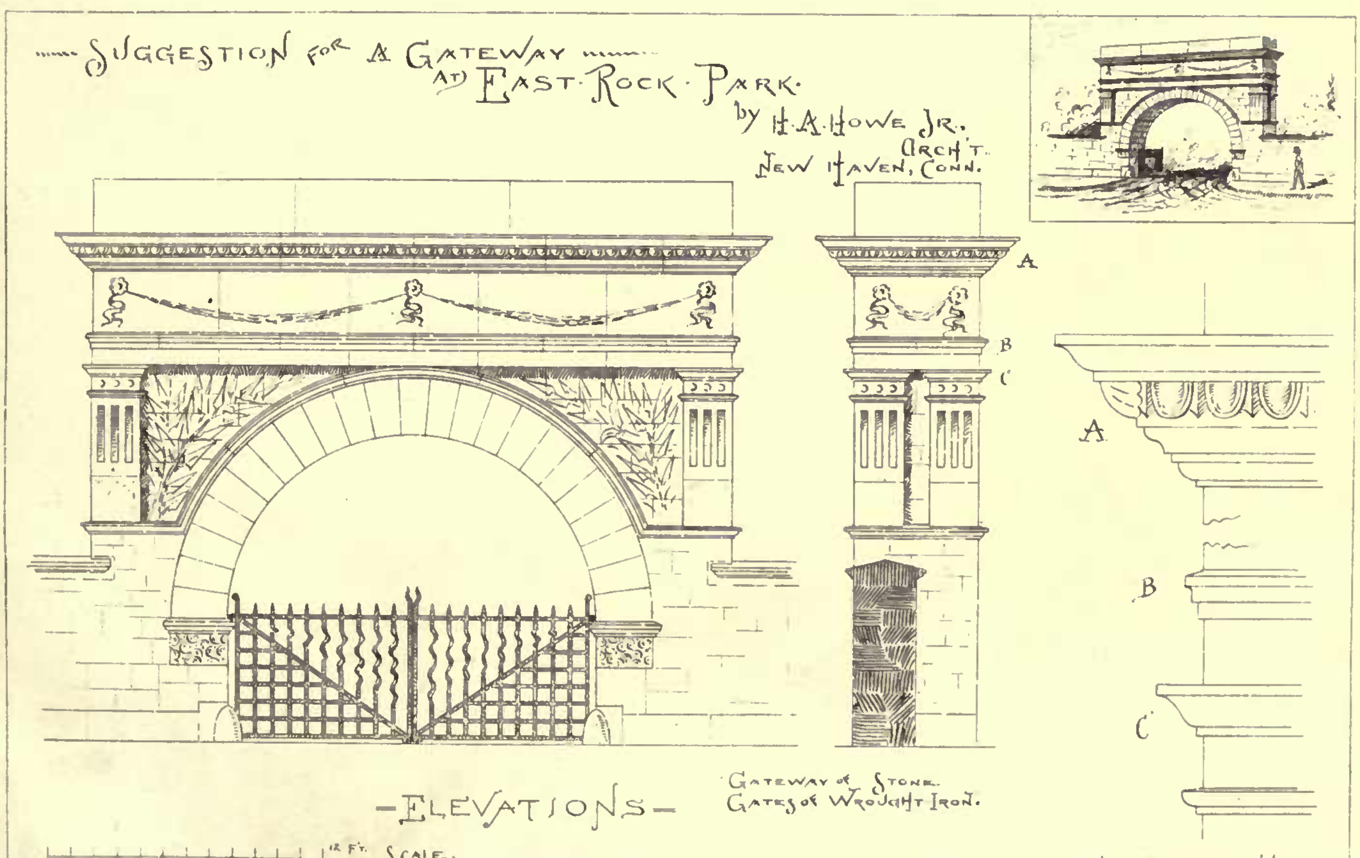
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to do the work. "Take the wood, and carve one thyself," said he. Brunellesco took him at his word, and spent many months over the crucifix, sparing neither time nor trouble, and when it was finished, he invited his friend to see it. Donatello entering the house with his apron full of eggs, cheese, vegetables and other things for their breakfast, was so astonished at its beauty that he threw up his hands, and dropped all the contents of his apron on the ground. The two crucifixes are still to be seen in the churches of Santa Croce and Santa Maria Novella. If Donatello's fault at this period of his life was excessive realism, he could not have done better than go to Rome. The eternal city was at that time a virgin forest of antiquities; statues were discovered only to be mutilated; buildings were ruined; treasures abounded on every side for the few who knew their value. So assiduous were the two friends in their search for artistic remains, that they were known as "*Quelli del tesoro.*" Donatello's enthusiasm was for sculptures, Brunellesco's for the architectural fragments; a difference of tastes which cemented their friendship, and enabled them later on to work together with such success in the cathedral, in the Chapel of the Pazzi and the Church of San Lorenzo. About 1405, Donatello returned to Florence, and was working with Ghiberti, with Michelozzo and Paolo Uccello. The "Annunciation," executed in 1406 for the Cavalcanti Chapel at Santa Croce, is one of the most beautiful of Donatello's bas-reliefs. The attitude of the angel is graceful in the extreme and full of religious sentiment; but the figure of the Blessed Virgin is marred by a twist in the lower part of the body. Above the entablature which is supported by two columns, are little child-genii holding festoons, the first example of what afterwards became a common conceit of the Renaissance sculptures; but it was the revival of the statue which was Donatello's chief work. In the Middle Ages, sculpture was used for the same purpose as the book in later times. When the people were unable to read, the placing of scenes from the Gospel or ideal subjects such as the Last Judgment as bas-reliefs over portals and on façades, was necessary for their education. But when learning became common, men could dispense with pictures in stone and wood, and turn their attention to work, the merit of which consisted in beauty of form, as Victor Hugo says "*Ceci tuera cela.*" Hence the revival of single figures and groups in *ronde bosse* such as Davids, Judiths, Saints and the like, which took the place of the Aphrodites, Athenes and Dionysi of old. Donatello worked in all materials; marble, stone, stucco, bronze, terra-cotta and "*stiacciato*," which is a kind of relief so imperceptible that it seems rather to be drawn or incised upon the stone, than chiselled.

M. Müntz is of opinion that Michael Angelo's "Moses" was inspired by Donatello's "St. John the Evangelist" in the Florence cathedral; and certainly a comparison between the two gives force to the assertion. The arms are in different position, and the heads are turned differently, and yet there is a similarity in the general effect that cannot be a mere coincidence. "*Nous ne pousserons pas l'irrévérence jusqu'à prononcer le mot de plagiat. Mais la critique manquerait à tous ses devoirs en ne revendiquant pas les droits de Donatello et en ne proclamant pas en sa faveur la priorité de l'invention.*" There are M. Müntz's words, and it is pleasant to find so great an authority giving utterance to an idea which has probably troubled many lesser minds.

The St. George of the Church of Or'San Michele is known to every one; but the bas-relief which was formerly underneath it, and is now on the other side of the church is often passed by unnoticed; and yet so beautiful is it, so harmonious in its lines, so exquisitely modelled, that even Raphael in his picture in the Hermitage did not disdain to copy it. In these works Donatello soared above the mere realist, which some of his earlier work, such as the "David" (Il Zuccone) proved him to be.

From 1425–33, Donatello associated himself with the architect Michelozzo, and to their united efforts we owe the tombs of Pope John XXIII in the Baptistery at Florence, of Cardinal Brancacci in the Church of Sant' Angelo a Nilo, Naples, and of Giovanni de Medici in San Lorenzo, and the exterior pulpit [1] (*pulpito della cintola*) of the Cathedral of Prato. In the latter work we find the first of those compositions of dancing children for which Donatello became so famous. During the Middle Ages children had been represented as pigmy men, or ill-formed, attenuated, stiff and boneless creatures; but Donatello re-introduced the natural, round, fat children of the antique sculptors; dancing, playing tambourines, singing, laughing, with wings it is true, but none the less more like Bacchantes or Genii than angels. Those now in the Bargello, which were designed for the organ-tribune of the cathedral, cannot be judged properly in their present position. Intended to be seen from below and at a distance, they are now, through the wisdom of the authorities, placed upon the ground, and thus looked down upon by the spectator.

In 1432–33 Donatello paid another visit to Rome, and to the inspiration of the antique, we owe the bronze statues of "Cupid" and "David" in the Bargello. The latter is one of his first entirely nude figures, and no doubt the easy pose and exquisite modelling of the limbs were the outcome of classic studies, added to his innate love of Nature. There is a pertness in this little David placing his foot upon Goliath's head, which is the very essence of boyhood; a self-satisfied expression which is only seen upon the faces of the extremely young when they feel that they have done an exceptionally clever deed. It was also about this time that the gates for San Lorenzo were executed. They consist of twenty panels, and although each division contains but two figures, they are all in different attitudes.

From 1443–53 Donatello was engaged upon the famous equestrian statue of Gattamelata at Padua, a work only second to the Colleone by Verrochio at Venice, and it is probable that the fine bronze horse's head in the Naples Museum is of the same period; if not a study for the statue itself. In the bas-relief of the life of St. Anthony, Donatello escaped the errors of Ghiberti, in treating sculpture as painting with effects of perspective, and of putting several subjects into one panel. Donatello was never married, and his life seems to have been devoted to his mother and his sister, with whom he lived, and his art. Earning little, he was always poor, often in debt; but he seems to have invariably made provision for paying his creditors. Simple in his dress as in his living, he is recorded to have returned a magnificent suit to his patron Cosmo de Medici, as being "too fine:" "*gli pareva essere delicato.*" And yet he had the true artistic pride, for upon one occasion, rather than receive what he considered inadequate payment for a bronze bust ordered by a Genoese tradesman, he threw it into the street where it was broken to pieces. He died in 1466, aged eighty-four, and was buried in San Lorenzo, near the tomb of his friend Cosmo de Medici.

That Donatello influenced to an enormous degree the sculptors of the Renaissance there is no doubt. Vasari relates that Michael Angelo studied his work with such success that one of his bas-reliefs of the Madonna was taken for a work of Donatello. Amongst his pupils were Nanni di Banco, le Rossa, Giovanni di Pisa, Agostino di Duccio, Bertoldo, Vellano and Andrea Riccio. Verrochio expressed such admiration for him, that when dying, he requested to have a crucifix carved by Donatello placed in his hands. That Donatello studied the antique, there is no doubt; but he seems to have infused life into his marble, and warmed it by the breath of humanity. His work may not be so classically correct, but it is more human. And yet, on the other hand it possesses the sentiment that later work has lost: it unites as it were the feeling of the Middle Ages with the knowledge of the Greeks. His saints are essentially Christian men and women, glorified by martyrdom. The agonized features that the early sculptors delighted in, have given place to a beautified expression. Their figures are those of flesh and blood, but have not yet degenerated into muscularity. Powerful they are, but of a power all his own. In M. Müntz's words, "*Le propre de ce génie c'est la toute puissance de l'artiste vis-à-vis de son art, c'est l'idée formée de toutes pièces dans le cerveau avant que la main ne saiscsse l'ébauchoir, et la volonté fixant cette idée dans le marbre ou le bronze avec une liberté et une audace incomparable.*"

At the end of the volume M. Müntz gives a list of all the books that have been written upon Donatello and his works.

S. BEALE.

THE PURIFICATION OF WATER BY MEANS OF IRON ON A LARGE SCALE.[2]



From Church of St Ambrose Milan, Italy.

DURING the session of 1882–83, in a Paper on "*The Antwerp Water Works,*" [3] the author had the honor of bringing under the notice of the Institution an adaptation of Professor Bischof's method of purifying water on a large scale by filtering it through a mixture of spongy iron and gravel. The operation of the process, as far as the effect upon the water was concerned, left nothing to be desired; uninterrupted work for nearly four years did not appear to have materially enfeebled the power of the filtering medium, nor to have sensibly diminished its quantity. Two defects, however, very soon became apparent. First, the filters, dealing with the exceptionally impure waters of the Nethe, proved incompetent to purify more than half the quantity of water expected; and, secondly, the upper layer of the mixture of gravel and spongy iron gradually hardened into a crust, and became clogged with slimy matter to such an extent as to render it necessary periodically to uncover the purifying medium, loosen its upper surface, and wash away the deposits which had accumulated. But the very circumstance that these operations became necessary, affords the strongest evidence of the potent action of iron.

The purifying beds were in the first instance, covered with a layer two feet deep of fine filter sand; the water was allowed to subside for at least twelve hours before it was admitted to them, and therefore must have reached the iron in as pure a state as ordinary subsidence and sand filtration could bring it to; and yet, the moment the surface of the iron mixture was reached, action took place so energetically, that not only was the mixture itself affected in the manner described, but the influence of the iron seemed to extend even upwards, as was evidenced by the discoloration, of the sand for two or three inches above the iron.

These facts, the author considers, are a conclusive answer to those who, in the discussion on the Paper referred to, alleged that simple sand filtration would attain the same results as those which had been reached by the iron method. The deposit which caused so much trouble was a

[1] See *American Architect* for July 25, 1885.

[2] From Selected Papers of the Institution of Civil Engineers. By William Anderson, M. Inst. C. E.

[3] *Minutes of Proceedings*, Inst. C. E., Vol. lxxii, p. 24.

mixture of salts of lime, and magnesia, derived from the softening of the water, and of organic impurities partly rendered insoluble by the action of the iron, and partly curdled up into a condition too gross to pass through the filter bed.

It is hardly necessary to remark that no deposit of impurities is ever found between the sand and gravel of ordinary filter beds, hence the impurities deposited at Antwerp must have been separated by the action of the iron. The steady increase in the demand for water rendered it evident that, at no distant date, the filters would prove incompetent to supply the engines, therefore the author, in conjunction with Mr. G. H. Ogston, Assoc. Inst. C. E., set to work to devise means by which the extraordinary powers of iron might be taken advantage of at a less sacrifice of capital and space than had hitherto been found practicable. The great difficulty lay in the rooted idea that, in practice, a contact of at least three-quarters of an hour was necessary to produce the required effect. The late Professor Way and Mr. Ogston had, indeed, shown that with very finely-divided iron, unmixed with gravel, a much shorter contact would suffice; but it was known also that a filter constructed of iron only in such a condition would very soon become clogged, so that no advantage would ultimately be gained. Mr. Ogston in conjunction with the author made numerous experiments with various forms of apparatus devised so as to ensure a rapid passage of water through a mass of material kept open by means of agitation, but the success was not commensurate with the cost of working, so that plan after plan had to be abandoned.

It was at last determined to try a method which had, at the very first, been suggested to the author by Sir Frederick Abel, C. B., F. R. S., Hon. M. Inst. C. E., who in Medlock's time had already had considerable experience in the use of iron for purifying purposes, namely, that of abandoning all attempts at filtration, or the passage of water through large masses of iron in favor of simple agitation of a comparatively small quantity of iron with the water to be treated. A wrought-iron cylinder four feet six inches in diameter by six feet long was accordingly arranged so as to revolve on hollow trunnions, and was fitted up internally with six shelves or ledges, whose office would be to scoop up the charge of iron placed inside, and shower it down continuously amidst the water flowing slowly through. The inlets were at first two inches in diameter, the intention being to purify at the rate of twelve gallons per minute, which would give the supposed necessary contact of water with the iron of forty-five minutes. The cylinder was charged with nine hundred-weight of iron, and set revolving at the rate of one-third turn per minute. The trial showed that vastly too much metal was being taken up by the water; the rate of flow was therefore increased to twenty gallons per minute, when 1.2 grain of iron per gallon was dissolved; and then to sixty gallons, when 0.9 grain was taken up, a quantity still far in excess of what experience at Antwerp showed to be sufficient, namely 0.1 grain per gallon. These experiments were so encouraging, that new trunnions with four-inch pipes were fitted to the cylinder, and the apparatus was sent to Antwerp, where it was finally put to regular work on the 13th of March, 1884, at the rate of 166 gallons per minute, giving a contact of three-and-a-half minutes only, which proved to be amply sufficient to purify the water. The quantity of spongy iron used during a run in which 6,854,400 gallons were passed through was 0.176 grain per gallon, including coke and other impurities, which form about thirty per cent of the material, so that in reality about 0.1 grain of pure iron per gallon only was taken up by the water.

The great advantage of using iron in the manner described arises from the circumstances, that the surfaces of the material are always kept clean and in an active condition by rubbing against each other and against the inner surfaces of the cylinder which contains them, as well as by continually falling through the mass of water. It is found that iron in almost any divided form is suitable for the process. The most active agents are cast-iron borings and turnings, on account, no doubt, of the way in which each particle is cracked and fissured; next, probably, comes so-called spongy iron; then cast-iron granulated by being poured into water; and lastly, wrought-iron and steel turnings.

The unexpected discovery that the time of contact between the iron and the water could, in practice, be reduced to about one-twelfth of what had always been held necessary, completely changed the aspect of affairs. The author was able to convince the Directors of the Antwerp Water-Works Company, by means of the steady and perfect action of the experimental revolver for many months, that the proper course to pursue would be to adopt the system for the whole of the supply, and convert the spongy-iron filters into sand beds. This recommendation was accordingly adopted, and immediately carried out.

The apparatus consists of three revolving purifiers, together capable of dealing with 1,500 gallons per minute (2,160,000 gallons per day), a small wall engine and line of shafting for driving them, a tank fitted with a fine screen for separating coarse impurities, and a purifying house 26′ x 31′ x 11′ 6″ high, added on to the screw-pump annex of the main engine-house.

Each purifier consists of a wrought-iron cylinder, five feet in diameter by fifteen feet maximum length, supported longitudinally on hollow trunnions ten inches in internal diameter, fitted with stuffing-boxes, through which the inlet and outlet pipes pass. The journals formed upon the trunnions, which are fifteen-and-a-half inches in diameter by five inches wide, rest in cast-iron blocks fitted into standards, which are secured to the thick concrete floor which covers the whole area of the house; the blocks are each capable of vertical adjustment by means of a wedge and screw, which enables wear to be readily taken up, a precaution rendered necessary to avoid cross-strains on the inlet and outlet pipes.

For scooping up the iron and showering it down through the water, the inside of the cylinder is fitted up with five curved ledges eight inches deep, and one ledge six inches deep, the latter formed of twenty blades six inches long, each attached to a seven-eighths inch shank, which passes through the cylinder, and is secured to it by a nut. The object of this arrangement is to give the means, by placing the blades askew, of throwing the iron back toward the inlet end of the cylinder, if the current of water passing along should tend to make it travel towards the outlet.

The inlet-pipe, where it opens into the cylinder, is covered by a disk of plate-iron, two feet eight inches in diameter, fitted within five-eighths inch of the spherical end, so that the entering water is compelled to spread out radially in all directions into a disk five-eighths inch thick. The outlet-pipe was, in the experimental revolver, protected by a screen of finely-perforated zinc, for the purpose of preventing the smaller particles of iron being washed out, but it was found to choke so rapidly with moss and other floating impurities, that some different plan had to be devised. The author ascertained, by experiment, that a velocity of four inches per second was incompetent to move any but the finest iron in a vertical tube; he accordingly expanded the outlet-pipe inside the cylinder into an inverted bell-mouth, of such diameter that the current upwards would not exceed four inches a second. The iron falling over this contrivance slips down its external surface, and is not carried up again by the slow upward current of water. A good deal of trouble was expected from the probability of the iron travelling with the water, but experience has shown that this tendency either does not exist at all, or is of a very feeble nature. The mean velocity of flow through the cylinder is only a little over three-fourths inch per second, but this motion is probably very irregular, made up of endless eddies, which effectually prevent the onward motion of the iron. The experimental revolver worked for months without any shifting being observed, but the larger ones above described have shown a slight tendency in the direction expected.

The ten-inch outlet-pipe communicates by means of a bend with an upright pipe of twelve inches diameter, which rises through the bottom of a tank, to which it serves also as a partial support; the lower end rests on the concrete floor of the house, and forms a pocket or trap, fitted with a hand-hole and door, from which any fine iron which may be carried over is readily removed. In the centre of the cylinder is an ordinary man-hole, fitted with a cover, in which is a three-inch brass screw-plug, through which periodical additions to the charge of iron can be readily made.

An air-cock is provided for the purpose of letting out the air when starting, and of getting rid, periodically, of the gases which, with some waters, collect during the running of the apparatus. These gases are so poor in oxygen that they instantly extinguish a lighted taper. The three revolvers are placed side by side, and connected on the inlet side by ten-inch branches, fitted with sluice-cocks to the twenty-inch delivery main from the screw-pumps. The outlet-pipes all open into a wrought-iron tank, fifteen feet long, three feet six inches wide, and three feet deep, fitted with an incline screen, covered with galvanized wire-netting, four meshes to the inch. A shallow trough is formed at the upper end of the screen, for the purpose of receiving and draining the solid matter scraped off from time to time. The object of the screen is to catch the large quantity of moss and other impurities which, especially in summer, form in the inlet-pipes to the screw-pumps, and constantly becoming detached, find their way to the filter beds. It is noteworthy that no such growths take place after the water has been purified. To shut off any of the revolvers from the tank, a lid, fitted with an India-rubber ring, is simply laid over the end of the delivery pipe.

The driving gear consists of an annular spurring, secured around one end of each cylinder. Each ring is actuated by a train of gearing working in a self-contained frame, secured to the floor of the house, and driven by a two-and-a-half inch belt from a lay shaft, coupled direct to the crank-shaft of a wall-engine, having a cylinder six-and-a-fourth inches in diameter, nine inches length of stroke fixed in the screw pump-house. The total weight of each revolver, filled with water, and with its charge of twenty-two hundred-weight of iron, is fourteen tons six hundred-weight, and the power necessary to drive it at the rate of one third of a revolution per minute is 0.4 H. P.

The total capacity of the three revolvers is 15,000,000 gallons per week.

The cost of the establishment in this country, including the house, would be £2,300, while the cost of working after allowing five per cent deterioration of the building, and ten per cent for that of the machinery, together with five per cent interest on the outlay, would be 9*s.* 9*d.* per million gallons; the cost in wages and materials alone amounts to 2*s.* 6*d.* per million. The total quantity of iron in use is less than three-and-a-half tons. Had the original filter beds been extended so as to do the same work, the weight of iron in them would have been 1,800 tons. The iron dissolved per week in full work will be about two hundred-weight.

The revolvers were started an the 12th of March, 1885, and have continued working steadily ever since; the water supplied to the town is reported to be exceptionally bright and clear, so that no

doubt need exist as to the success of the new method of purification. The distribution of the iron throughout the length of the cylinders remains singularly even, not only with respect to quantity, but also with reference to the proportions of fine to coarse particles.

MASPERO'S EGYPTIAN RESEARCHES.



From Church of San-Vitale, Ravenna. Italy.

EVERY winter it is Professor Maspéro's delightful duty to perform a voyage of discovery. Bidding a temporary farewell to the Boulak Museum, he at the same time parts company with the nineteenth century and sails away into the past. After some four or five months he returns laden with spoil, having in the course of his cruise touched at many far-distant epochs, and done business with the pyramid kings, the Pharaohs, the Ptolemies, and the Romans. From one of these expeditions he has just come back, towing five boat-loads of antiquities in the wake of his dahabeah. To unpack, arrange, and catalogue these new treasures will more than occupy him for the next eight or ten weeks.

The most striking work of the season in Upper Egypt is doubtless the excavation of the great Temple of Luxor, now for the most part disencumbered from the rubbish mounds and mud huts in which for many centuries it has been three parts buried. The village mosque, the house of the British Consul, and a few isolated hovels alone obstruct the pillared vistas of this noble structure, which rivals even Karnak in the majesty of its proportions. But apart from this great public work, which Professor Maspéro has personally superintended, there have been excursions and discoveries at various points of the river above and below Thebes. Unlike the majority of explorers, Maspéro by no means confines his attention to great historic sites. Every year he devotes a certain proportion of his time to the investigation of minor localities; that is to say, to the mounds and fragmentary ruins of ancient provincial towns, and to the search for yet undiscovered provincial cemeteries. The objects found at such places are often of much historical value. A royal inscription graven upon the face of a cliff, a rock-cut shrine unknown to Murray and the tourist, a group of tombs belonging to some period scantily represented elsewhere, a tablet recording the name and titles of some important personage who ended a stirring career in the retirement of his native province — such are the frequent fruits of these departures from the beaten track, and in such Boulak becomes richer with each successive season. Thus, just as Professor Maspéro happened, a few months ago, to arrive in the neighborhood of a certain village called El-Khezâm, some workmen who were engaged in digging a well came upon a subterranean structure built of bricks and roofed over, apparently, by a large flat stone some nine feet in length. In the East every such stone conceals buried treasure, and, as a matter of course, is smashed immediately. Fortunately, the local police interposed, and the work was suspended till Maspéro came. The structure proved to be a funerary chapel, and the flat stone a fallen tablet, or *stela*, fashioned in the form of a door and inscribed to the memory of a great Theban nobleman of the obscure time of the Eleventh Dynasty. Great was the disappointment of the assembled crowd when, instead of gold and jewels, there were found in this already desecrated sepulchre only a few fragments of limestone and a heap of potsherds. For two months after this some twenty Arabs went on heroically digging for the treasure, which of course never existed. At Siout an interesting discovery has been made, and in a very curious manner. A Mogrebin sorcerer of local fame predicted the discovery of hidden gold in the great Arab cemetery to the southward of the town. Permission being obtained to dig, and a Boulak official being present, the sorcerer performed certain incantations and pointed out the spot. Here his employers, two Greek traders of Siout, set their workmen to excavate, who, strange to say, at a depth of fourteen feet from the surface, came upon a small cavern or chamber quarried in the solid rock, and containing a brick oven, with its iron door yet perfect, a precious store of more than two hundred antique vases in stone and bronze, a lump of black fatty clay, and on the floor a quantity of leaf-gold, beaten extremely thin and rolled in little rolls. At sight of this gold the spectators became wildly excited, Copts, Greeks and Mussulmans claiming the treasure, reviling each other, and struggling to get into the vault. Just, however, as the police were well-nigh overpowered, a detachment of soldiers with fixed bayonets appeared upon the scene and dispersed the rioters. Professor Maspéro does not say whether the Greek traders got the gold or not. Its value, at all events, was estimated at only 1,400 francs. But the Museum carried off the vases, many of which are of rare archaic types, and must have been brought together from very ancient tombs of the great monarchs or princes vicegerent of the Lycopolitan nome, whose rock-cut sepulchres abound in the neighboring mountains. As for the subterraneous cavern, Professor Maspéro is of opinion that it was originally a tomb, converted by some Arab alchemist of the Middle Ages into a secret laboratory. Hence the oven, the vases, the leaf-gold, and the deposit of black clay, which proved to be largely impregnated with arsenic.

At Edfoo, celebrated for its magnificent Ptolemaic temple, search has till now been vainly made, season after season, for the necropolis that must have existed in connection with so important a locality. This necropolis has at last been discovered near the village of El Qaçâa, about six miles higher up the river. The tombs are excavated, or rather tunnelled, in a friable limestone crag, so pierced and honeycombed with pits, chambers, and galleries that the frail stone has given way in all directions, and caved-in upon the congregated dead. Only one tomb has been found intact, and this may probably be taken as a sample of those which are ruined. A shaft six feet square and twelve feet deep terminates in a small chamber with a stone bench along one side. This chamber opens into a large hall, the walls of both being surrounded with oblong niches like the *loculi* in the Roman catacombs. In these *loculi*, lying at full length, some merely bandaged, some enclosed in richly gilded and painted "cartonnages," were found a great number of mummies. Others, dragged from their resting places and despoiled of their coverings, strewed the floor. At the farther end a pile of inferior mummies, evidently of a much more recent date, were laid in an unceremonious heap. Fragments of inscriptions and the painted legends on some of the finer mummies revealed the history of the occupants of this tomb. The more important were members of a great feudal family which governed Edfoo toward the close of the Ptolemaic period. Two or three hundred years later, about the time of Septimius Severus, this family had become extinct, and the tomb was used as an open catacomb for the mummies of the minor priests and servants of the great temple.

Another interesting necropolis near Gebelein, belonging to the small provincial city of Aphroditopolis, has yielded some very ordinary mummies, but an extraordinary wealth of funerary furniture. In these tombs have been found wooden bedsteads precisely similar to the little bedsteads in use in Nubia at the present day; also stools, whetstones, bows, arrows, clubs, boomerangs, staffs, horn goblets, spoons in wood and ivory, reed pipes, bread, corn, honey, cosmetics, and even wax dolls. The weapons are mostly broken. This was purposely done in order to kill them, that their Kas or ghostly doubles should thereby be freed from the restraint of material form, and so be at the service of the dead man's double in the tomb.

At Ekhmeem, it will be remembered, we announced more than a year ago the discovery of a vast and hitherto unsuspected necropolis. Never did cemetery so well merit that name. The necropolis of Ekhmeem is a city the inhabitants of which, summoned by the inexorable explorer, rise daily by hundreds from their narrow beds, and have been so rising, without any sign of diminution in their numbers, ever since the first spade struck the soil. Thousands have been already disinterred, and apparently there are endless thousands yet to come. The mountain in which these tombs are excavated is a level limestone cliff about a mile in length. Not only is it pierced with innumerable sepulchral chambers, but every natural fissure of rock has been utilized and filled up with mummies. The descent into these tombs is for the most part tolerably steep. Some are forty feet, fifty feet, sixty feet deep, leading to what may be described as subterraneous dwellings, in which eight or ten little chambers, one above the other, contain about a dozen mummies in each. These, however, are not family vaults, but the resting places of persons in nowise connected, as the inscriptions show, one with another. They are not private dwellings of the dead, but rather hotels, let out by the proprietor. — *London Times, July* 27.

PIRATED DESIGNS.

LA CROSSE, WIS., September 8, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Among your long and varied experience you have, no doubt, had occasion to meet with cases of piracy of plans of more or less pronounced features. I have carefully gone through the legal decisions, as published from time to time in your valuable journal, but am unable to find among the files in my possession anything that would bear directly on my case. The matter stands thus: After an extensive conflagration, destroying a whole block in one of the small towns along the Mississippi in Iowa, I was employed to make designs for a new store-building. The sketch was accepted, plans and specifications drawn up, and in due course of time paid for. The building was begun, but meanwhile the owners of the adjoining burnt district took a fancy to my plans and proceeded quietly to erect their buildings, also according to my plans, without my knowledge at the time. This was all the easier for them, as they all employed the same firm of contractors. So, instead of one building, nine of them went up. The original one has been completed, but though the specifications contained a clause to that effect, they, with the plans, have not been returned to me yet, probably because they are needed on the other buildings. Now, I would like to ask you, how am I to proceed in this matter? Will it be against the owners, or against the contractor? also, do you know of any such cases that have been decided by a court? I know of only one such case, but that was compromised before it was carried that far. I should like to hear of some precedents, in case I should be forced to go before a court with my claim. As the case may be of some interest to other

members of the profession an answer in the columns of your journal will be gladly received. Yours respectfully,

Gustave Stoltze.

[Unless Mr. Stoltze had copyrighted his design, he could not, we think, prevent any one, who fancied his store-front, from building another like it. The unauthorized use of his drawings is, however, a different matter. In this the contractor seems to have been at fault, and the only question would be, whether the architect or his client is the proper person to call the contractor to account. Mr. Stoltze says that the specification contained a clause requiring that the drawings should be returned to the architect. Now, as the specification forms ordinarily a part of the contract between the owner and the builder, the failure of the latter to comply with this stipulation constitutes a violation of his agreement with the owner, who is, of course, entitled to recover compensation from the builder for all damage that he may have suffered from the breach of this agreement, including, we think, such indemnity as he may think proper to allow the architect for the injury to his reputation and business. It is possible that Mr. Stoltze might recover compensation in his own name from the builder for the injury resulting from the misappropriation of the drawings entrusted to the latter, but such a claim would bring up the vexed question as to the proprietorship of the drawings which the builder had misused, and it would be much better to act through the owner, who has an undoubted right to punish the breach of contract, and, besides what he may suffer by reason of his obligations to the architect, has a grievance of his own, in having the effect of his building cheapened by the erection of duplicates near it. So far as the owners of the duplicates are concerned, it is hardly likely that they would have conspired with the builder to use surreptitiously the drawings of an architect unknown to them; and our experience is that such persons, on the architect's position being explained to them, are generally willing to pay a fair compensation for the services which he has unintentionally rendered them.—Eds. American Architect.]

NOTES AND CLIPPINGS.

The Pension Bureau Frieze:—A member of congress who was a cavalry officer during the war visited the new Pension Bureau the other day for the first time and was overcome when he made the discovery that every cavalry-man in the terra-cotta bas-relief frieze around the building is holding the horse's reins in the right instead of the left hand.—*Washington Critic.*

Inigo Jones.—Inigo Jones designed movable scenery and contrivances for the Court masques, especially those written by Ben Jonson. Inigo Jones was a true-born Londoner, born near St. Paul's in the days when Queen Bess ruled the waves around England, the son of a citizen and cloth-worker, a respectable man, in religion a Catholic. Inigo was apprenticed to a joiner, but early distinguished himself by his skill with his pencil, and gained notice for his designs, more particularly landscape views. He first displayed his talent and ingenuity in the preparation of the Court masques, at the time the fashion. Ben Jonson and he were long associated, but the friendship was cut short by a bitter life-long quarrel; the poet satirized the artist without mercy as "Lantern Leatherhead" and "Inigo Marquis Would-be!" Inigo was buried at St. Bennet's, Paul's Wharf. The story of his life is half droll, half pathetic. His only daughter and heiress married John Webb, his pupil and executor. Webb was, like Inigo Jones, an architect, but he designed and painted the scenery of the "Siege of Rhodes," one of the earliest English operas—a piece produced with unparalleled splendor, wherein, learned authorities say, scenes were for the first time introduced in public on the English stage. Hangings had previously been used, scenes employed only in private performances, we are told.—*London Society.*

The Recession of Niagara.—Sir Charles Lyell, in 1841 and 1842, estimated the gradual recession of Niagara Falls by the undermining of its brink at the rate of about one foot per annum. Recent investigation of the subject by a Commission for the establishment of a State reservation at the falls, have, however, shown that this and other estimates are more or less erroneous. A map, based on surveys of the falls made in 1883 by Mr. Thomas Evershed for the New York State surveyor, have shown that in the forty-one years ending 1883 the annual rate of maximum recession has been six and one-sixth feet. For the eight years ending 1883 this rate is given as sixteen and one-half feet, so that the rate of recession has been higher of late. These results were obtained from the Canadian Fall, while the American Fall was found to have receded at the rate of ten inches per annum during the forty-one years ending 1883. It has been shown by the surveys that these two falls were once united; and that, supposing the rate of recession to continue, the Niagara gorge will be cut through in some 10,000 years. Lyell's estimate was 35,000 years. Of course these attempts to calculate the cutting of the entire gorge, which terminates at the heights near Lake Ontario, assume that the hardness of the shale and lime-rocks, volume of water, and height of the fall, continue much the same as they are now.—*Engineering.*

A Unique Grant Monumment.—The State fair at Peabody, Kan., has the honor of raising the first monument to Gen. Grant. Their achievement is peculiarly a State product, and will doubtless remain unique in the history of Grant memorials. It is an obelisk of wood standing upon a pedestal, the whole covered with various forms of corn, and standing forty-seven feet high. The sides of the obelisk are made of ears of yellow corn, and bear the inscriptions, "Peace," "Plenty," "Union," and "Liberty" worked in red ears adown the faces. The pedestal faces are covered with mosaics of corn-stalks, each face having a portrait of General Grant set in weaths of pop-corn ears with the husks on, brightened with red peppers, representing laurel berries. The cornice of the pedestal is made of sorghum stalks, and each corner is adorned with a hugh yellow pumpkin. At each side of the shaft are stacks of mimic arms, made of giant corn-stalks and past these the Kansas grangers file to pay their tribute of respect to the dead, mingled with open-mouthed wonder at the greatness of their State. This structure is not a work of art, and one can hardly read the description without a smile, but there is about it a touch of that deeper, broader poetry that underlies American life and institutions. It could have been raised nowhere else. No people accustomed to the horrors of war could have represented a stand of arms by corn-stalks; but a corn-stalk bayonet is a pleasanter object than a steel one, nevertheless. The Kansans built their obelisk of corn because they are proud of their mammoth, shining ears; and very good things they are to be proud of, though not so worthy of honor as the peace and prosperity that made their growth and dedication to such a use possible; those are in direct accord with the last wish of the great commander for his reunited country.—*Springfield Republican.*

A Dwelling which antedates the Conquest.—A correspondent writes to the London *Times* from Deerhurst, in Gloucestershire: Within the last week an interesting discovery has been made here of the existence of a very ancient structure. It was always known that a portion of a farmhouse called Abbot's Court, belonging for centuries, first to the Abbey, and, subsequently, to the Chapter of Westminster, was of considerable antiquity, but there was nothing on the surface to determine its age. Within the last few days, however, it has been subjected to careful examination, and features hidden for ages have been brought to light. The original house was small, 30 feet long on the inside, with walls two-and-one-half feet thick. Its four external walls are perfect. In one of the end walls is inserted a large round-headed archway, having very solid jambs and imposts. A smaller archway is found in the wall forming the front of the house. Both these archways tend slightly to the horse shoe form—that is to say, the centre of the semi-circular head is rather above the spring of the arch. The house must have always had an upper story; and in this there is now to be seen a round-headed window, splayed both inside and outside. The reason for assigning so very early a date to an existing dwelling house is the following: Its rude and very peculiar architecture follows closely that of Deerhurst Church, which is within a stone's throw of it. Now, there is good evidence to show that the church was built in the year 1056. The late Mr. Parker entitled it "the oldest dated church in England." Just about the time given above, Edward the Confessor gave the large Deerhurst Manor, including the estate on which Abbot's court stands, to his new Abbey of St. Peter's, Westminster. Abbot's court may have been erected at the actual time of the donation. It is singular that close to this very ancient house there should be standing another also of remarkable antiquity. This is Deerhurst Priory, which was a religious house dating from the eighth century, and belonged to the Abbey of St. Denis, near Paris. A portion of its buildings still exist, and they show a Norman column in the cellar of the inhabited house.

A Lawsuit over the Construction of Niagara's Cantilever Bridge.—The wonderfully rapid construction of the Michigan Central Cantilever Bridge, spanning the Niagara, two years ago, has been recalled by an action which has been on trial at Lockport for the last three days in the Circuit Court before Judge Henry A. Child and a jury. The suit was brought by Charles A. Turner, of Suspension Bridge, against General George S. Field and others, of Buffalo, to recover over $3.000 for extra work and incidentals connected with it on the gigantic "false work" or scaffolding which was built from top to bottom of the high bank of the river and extending over the water on either side. It was the largest job of scaffolding ever undertaken in this region, and in itself was one of the greatest curiosities connected with the Cantilever Bridge. A description of the work appeared in *The Times* of September 2, 1883, and photographs of it were exhibited to the jury on this trial. The defendants were what was known as the Central Bridge Company, of Buffalo, and took the entire contract for the construction of the bridge. They sublet the work to Dawson, Simms & Mitchell under a precise written contract, which largely left the direction of the work to the engineer in charge, and which prohibited any further subletting. Notwithstanding this the sub-contractors did let to the plaintiff the false work. The plantiff was proceeding with the work, beginning at the top and working down, when he was interrupted by the engineer, who insisted that this method would not do; that in the excavation of "mud sills" or vests for the timbers on the bank the throwing out of the soil and stones from the upper ones, might form a shaky and insufficient foundation for those farther down, and the whole work be endangered, requiring, in short, that the plaintiff should begin at the bottom of the bank and build upward. As testified by the plaintiff the additional cost of building this false work in the way required by the engineer was $2,200, and the construction of long "slides" for the timbers, and some other items, added at least $1,000 to it. The plaintiff says that before proceeding he saw General Field and stated the difficulty to him and his unwillingness to go on unless the additional sum was paid him; that General Field visited the work, spoke of the great importance of having it securely done and the need of avoiding delay, and finally told plaintiff to go on and build it according to the views of the engineer, and that he and his associates would pay the extra expense. This new contract was positively denied by Field. He swore that he answered the plaintiff that Dawson, Simms & Mitchell were under contract to do all this work, and that he would pay no one else, and would not pay the plaintiff. This was the gist of a mass of evidence, most of which related to the nature of the work, the value of it, and the difficulty of performing it in the manner required by the engineer. There was absolutely no testimony to corroborate either party as to the question of defendants' engagement to pay for the extra work, but the probabilities seemed to favor General Field's denial, inasmuch as the defendants already had the written contract of Dawson, Simms & Mitchell to do the whole work. The evidence was closed on Friday night. At the opening of the court next morning neither the plantiff nor his attorney was present, and the Judge proceeded with his charge without any summing up. He had half finished it when the plaintiff and his counsel appeared, and the latter asked permission to address the jury. This was denied by the court, and the charge was finished. It was rather favorable to the defendants. The jury returned a verdict for the plaintiff for $38.08, which appears to be merely one-third of the expense of a watchman paid by plaintiff.—*New York Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

325,231. SEWER-TRAP AND CESSPOOL.—Howard G. Badgley, New York, N. Y.

325,237. DEVICE TO BE SUBSTITUTED FOR THRESHOLDS.—Alfred A. Chase and Daniel H. Hesselton, Holden, Mass.

325,243. VENTILATING ATTACHMENT.—Benjamin J. Goldsmith, Saratoga Springs, N. Y.

325,245. SLIDING DOOR.—Herbert H. Hewitt, New York, N. Y.

325,281. HOUSE-FURNACE.—James Spear, Philadelphia, Pa.

325,299. DOOR-OPENER.—Chas. E. Whitney, Brooklyn, N. Y.

325,333. WINDOW CONSTRUCTION AND FASTENING AND HINGE.—Ole Flagstad, Hamar, Norway.

325,381. FIRE-ESCAPE.—William C. Barkley, Litchfield, Ill.

325,399. FIRE-ESCAPE.—Daniel F. Davis, Easton, Pa.

325,417. SMOKE-HOUSE.—Joseph Kremser, Springfield, N. Y.

325,445. ATTACHING KNOBS TO SPINDLES.—Wm. Regan, Branford, Conn.

325,449. CUT-OFF.—Frederick Schneler, La Salle, Ill.

325,450. FIRE-ESCAPE.—Samuel Snyder, White Sulphur Springs, Mont.

325,463. ANNUNCIATOR.—Henry E. Waite, New York, N. Y.

325,479. SPIRIT-LEVEL.—Robert Barker, Lansing, Mich.

325,481. SASH-FASTENER.—Wm. J. Barron, Huntsville, Ala.

325,484. SINKING HYDRAULIC PILES.—Lowell E. Blake, El Paso, Tex.

325,486. TRAP FOR BATH-TUBS, SINKS, ETC.—Chas. A. Blessing, Philadelphia, Pa.

325,505. SCRATCH-GUAGE.—David S. Conrad, Waynesborough, Pa.

325,529. WINDOW-SCREEN.—Steele F. Gillmore, Princeton, Ind.

325,545. KNOB ATTACHMENT.—Robert M. Keating, Springfield, Mass.

325,553. AUTOMATIC VALVE FOR SEWER-PIPES.—Thomas L. McKeen, Easton, Pa.

325,554. STEAM-RADIATOR.—Thomas L. McKeen, Easton, Pa.

325,556. JOINT FOR METAL TUBES.—William A. Miles, Copake Iron Works, N. Y.

325,571. SPOKESHAVE.—Charles W. Smith, Westerly, R. I.

325,587. WATER-CLOSET.—William Bunting, Jr., Boston, Mass.

325,597. WEATHER-STRIP.—Green L. Fowler, Clarksburg, Mo.

SUMMARY OF THE WEEK.

Baltimore.

CHURCH.—The corner-stone of St. Gregory Roman Catholic Church, in the north-western section of the city, was laid September 13.

BUILDING PERMITS.—Since our last report thirty-five permits have been granted, the more important of which are the following:—

Schamburg & Dashield, 5 three-st'y brick buildings, e s Riverside Ave., s Clement St.

C. Wolf, three-st'y brick building, n s Lombard St., bet. Eden and Spring Sts.

John Miller, 3 two-st'y brick buildings, w s Bruce Alley, n Harlem Ave.

Dr. G. H. Grimes, 2 three-st'y brick buildings, n s Fayette St., bet. Frederick and Harrison Sts.

R. L. Cutting, 5 three-st'y brick buildings, w s Charles St., s Hoffman St.

S. B. Derr, 6 three-st'y brick buildings, e s Linden Ave., n Robert St.

F. Wilson, 5 three-st'y brick buildings, s s Edmonson Ave., com. cor. Kirby's Lane.

W. H. Fowler, 11 two-st'y brick buildings, n s St. Joseph's St., e Bond St.

E. W. Gorman, 19 two-st'y brick buildings (sq.) s Christian St., bet. Payson and Monroe Sts.

G. W. Donohue, 4 two-st'y brick buildings, n s Jefferson St., bet. Chester and Duncan Alley; and 12 two-st'y brick buildings, w s Duncan Alley, bet. Jefferson and McElderry Sts.

G. W. Moke, Jr., 4 three-st'y brick buildings, w s McCulloch St., n of Laurens St.

Boston.

BUILDING PERMITS.—*Wood.*—*Chambers St.*, cor. Waters St., dwell. and store, 12′ x 10′ and 19′ x 40′; Mrs. J. Harleigh, owner; J. McCusher, builder.

Brick.—*Marlborough St.*, *No.* 401, dwell., 36′ x 58′; owner, William Simes; builder, G. F. Shepard.

Dudley St., cor. Langdon St., school., 85′ 6″ x 141′; owner and builder, City of Boston.

Decatur St., *No.* 4, tenement, 22′ x 37′; owner, John May, builder, Peter Schell.

Brooklyn.

BUILDING PERMITS.—*Lafayette Ave.*, n s, 250′ e Broadway, 6 two-and-a-half-st'y frame dwells., tin cornices; cost, each, $3,000; owner, Anna A. Fardon, 1145 Lafayette Ave.; architect and mason, Alfred A. Fardon.

Cook St., w s, 100′ e White St., three-st'y frame shop and dwell., tin roof; cost, $3,500; owner, A. Finegel, 73 Ten Eyck St.; architect, H. Vollweiler.

Fourth St., n s, 109′ 5″ e Hoyt St., one-st'y brick oven or kiln for burning tiles; cost, $6,000; owner, architect and builder, International Tile Co., 92 Third St.

Elm St., *Nos.* 82, 84, 86 *and* 88, s s, 25′ e Evergreen Ave., 4 three-st'y frame (brick-filled) tenements and one store, tin roofs; cost, total, $16,000; owners and builders, C. C. Gran and C. Hartmann, Sumner Ave. and Hopkins St.; architect, Th. Engelhardt.

Leonard St., *No.* 682, e s, 150′ n Meserole Ave., three-st'y frame dwell., gravel roof; cost, $6,000; owner, Mrs. Abby J. Bartlett, 209 Calyer St.; architect, F. Weber; builders, S. F. Bartlett and I. & J. Van Riper.

Prospect Pl., s s, 184′ e Rogers Ave., 3 two-st'y brick dwells., gravel roofs; cost, each, $7,500; owner, Mary E. Fowler, 8 Verona Pl.; architects, Parfitt Bros.; builder, L. Fowler.

Willow St., n e cor. Pineapple St., 3 four-st'y brick and brown-stone dwells., tin roofs; cost, total, $25,000; owner, Charles Arbuckle, Willow St.; architect, W. B. Tubby.

Fifth St., e s, 75′ n North Eleventh St., two-st'y frame factory and dwell. and one-st'y extension, felt roof; cost, $4,500; owner, Daniel Culhane, Fourth St., cor. South Fifth St.; architect and contractor, Thomas A. Akert; masons, Mead & Son.

Graham Ave., *No.* 466, e s, 75′ s Meeker Ave., three-st'y frame tenement, tin roof; cost, $4,800; owner, Antone Long, 38 Meeker Ave.; architects and contractors, Sammis & Bedford; masons, Doyle & Brazill.

Chauncey St., n s, 200′ e Patchen Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,500; owner, Johanna F. Sullivan, 1894 Fulton St.; architect, M. Walsh; builder, J. F. Sullivan.

Columbia Heights, *No.* 158, w s, 25′ s Clark St., four-st'y dwell., tin roof; cost, $25,000; owner, Wm. A. White, 125 Remsen St.; architect, W. B. Tubby; builders, J. Thatcher and F. D. Norris.

Sixth Ave., n s, 97′ 10″ w Sixth Ave., 3 two-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $3,500; owner, architect and builder, Thos. Butler, 371 Sixth Ave.

Ten Eyck St., *No.* 207, n e, 150′ e Humboldt St., four-st'y frame (brick-filled) tenement, tin roof; cost, $5,800; owner, Herman Wild, 226 Graham Ave.; architect, Th. Engelhardt; contractor, D. Kreuder; mason, C. Wahler.

Central Ave., *Nos.* 170, 172 *and* 174, s s, 73′ from Elm St., 3 three-st'y frame tenements, tin roofs; cost, total, $12,500; owner, Margaretha Schwab, 166 Central Ave.; architect, E. Schrempf; builder, G. Schwab.

Ivy St., *No.* 75, n s, about 300′ e Bushwick Ave., two-st'y frame dwell., tin roof; cost, $3,000; owner, John A. Hopper, 75 Woodbine St.; architect, A. Garlepy; builders, Simpson & Lowe.

Broadway, w s, 25′ s Ellery St., three-st'y frame store and tenement, tin roof; cost, $4,800 to $5,000; owner and architect, John Stockel, 249 Ellery St.

Wallabout St., s s, 175′ e Harrison Ave., three-st'y frame tenement, tin roof; cost, $4,500; owner, Geo. Schoch, 374 Wallabout St.; architect, H. Vollweiler; builders, Mr. Hoepfer and Mr. Fuchs.

Monroe St., s s, 80′ w Patchen Ave., three-st'y brick tenement, gravel roof, wooden cornice; cost, $4,000; owner, Phœbe M. Saxton, 75 Willoughby Ave.; architect and builder, R. Van Brunt.

Herkimer St., n s, 50′ w Buffalo Ave., 3 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $4,500; owner, W. Wubke Grothe, Herkimer St.; architect, E. Schrempf; builder, J. Hertlein.

Lafayette Ave., n w cor. Lewis Ave., 5 two-and-a-half-st'y brown-stone stores and flats, tin roofs; cost, corner, $7,000; others, each, $4,500; owner and builder, P. F. O'Brien; architect, I. D. Reynolds.

ALTERATIONS.—*Broadway*, w s, 50′ s Willoughby Ave., repair upper stories of four buildings damaged by fire; cost, $3,000; owner, Benj. Warner; builder, S. Faltonte.

Gates Ave., *No.* 885, three-st'y brick extension, tin roof, wooden cornice, interior alterations and new front walls; cost, $3,300; owner, A. S. Walsh, Madison St, near Reid Ave.; architect, C. Lincoln; builder, A. Miller.

Chicago.

BUILDING PERMITS.—Mrs. H. A. Brown, two-st'y dwell., 3221 Cottage Grove Ave.; cost, $4,000; architect, Wm. Strippelman.

A. Kramer, two-st'y dwell., 1298 West Harrison St.; cost, $3,000.

S. Nelson, three-st'y flats, 376 La Salle St.; cost, $12,000; architect, Halberg.

H. Krick, 3 two-st'y dwells., 3437-3439 Prairie Ave.; cost, $9,000; architect, W. Strippleman.

A. Lowka, three-st'y store and flats, 105 Cleaver St.; cost, $6,000.

W. H. Hoyt, 2 four-st'y dwells., 347-349 Indiana St.; cost, $12,000; architect, A. Smith.

J. Ruddy, 3 three-st'y dwells., 117-121 Centre Ave.; cost, $9,000.

J. O'Malley, 2 three-st'y dwells., 3217-3219 Dearborn Ave.; cost, $12,000; architect, J. J. Flanders.

H. Frese, three-st'y dwells., 413 Dayton St.; cost, $5,000; architect, G. Spohr.

F. A. Degolyer, one-st'y store, 692 Congress St.; cost, $2,500; architect, E. S. Denison.

C. H. Hall, two-st'y dwell., 1218 Jackson St.; cost, $3,000.

O. Gumbinger, three-st'y store and dwell., 293 Clybourne Ave., cost, $5,000; architect, J. Bruhors.

Freiberg Bros., remodel building, Twenty-second St.; cost, $9,000.

P. D. Gill, two-st'y church, 91-93 Cypress St.; cost, $14,000; architect, J. J. Eagan.

H. Dammann, three-st'y store and dwell., 1198 Milwaukee Ave.; cost, $9,000; architects, Schaub & Berlin.

H. Stech, two-st'y dwell., 566 North Robey St.; cost, $4,000.

Mrs. M. E. J. Moody, two-st'y flats, 2430 Dearborn Ave.; cost, $5,000.

J. M. Sanders, 2 two-st'y stores and flats, 204-206 Colorado Ave.; cost, $4,200.

J. L. Campbell, 11 two-st'y dwells., Warren Ave.; cost, $50,000; architects, Edbrooke & Burnham.

G. P. Holmes, two-st'y dwell., 687 Washington Boulevard; cost, $10,000; architect, J. J. Flanders.

J. Sheehey, three-st'y store and dwell., 448 West Harrison St.; cost, $6,000; architect, H. Van Pelt.

M. Burgeson, three-st'y store and dwell., 242 Division St.; cost, $7,000; architect, S. Lenderoth.

G. Link, two-st'y dwell., 238 North State St.; cost, $3,000; architect, J. Huber.

E. A. Bassett, two-st'y dwell., 3546 Indiana Ave.; cost, $6,500; architect, H. Van Pelt.

L. Metz, four-st'y factory, 145 Ontario St.; cost, $8,000; architect, C. Berlin.

A. Jansen, three-st'y dwell., 154 Rumsey St.; cost, $4,000.

Grant Place Methodist Church, two-st'y church, 1001-1007 North Halsted St.; cost, $28,000; architect, W. A. Furber.

J. De Vos, two-st'y store and dwell., 211 Racine Ave.; cost, $3,000.

J. Hutton, two-st'y flat, 215 Seminary Ave.; cost, $3,000.

T. Crowley, 6 one-st'y cottages, 1235-1247 Fifteenth St.; cost, $6,000.

J. H. Broham, two-st'y flats, 281 Idaho St.; cost, $3,000.

J. Coughlan, two-st'y dwell., 82 Centre Ave.; cost, $4,000; architect, J. V. Wadskier.

A. Melta & Bro., two-st'y factory, Halsted St.; cost, $6,000.

J. L. Campbell., two-st'y dwell., 117 Leavitt St.; cost, $5,000; architect, W. Strippleman.

J. L. Campbell, two-st'y dwell., 263 Campbell Ave.; cost, $4,000; architect, C. A. Weary.

G. Farwell, two-st'y dwell., 1625 Prairie Ave.; cost, $10,000; architects, Treat & Foltz.

Mrs. E. Young, two-st'y dwell., 461 Warren Ave.; cost, $3,000.

J. Itan, 2 two-st'y dwells., 383-385 Marshfield Ave.; cost, $8,000; architect, T. M. Bell.

J. E. Young, two-st'y dwell., 97 McAllister Pl.; cost, $8,000; architects, Treat & Foltz.

J. & M. Wolff, 4 two-st'y dwells., 3149-3155 Calumet Ave.; cost, $20,000; architects, Edbrooke & Burnham.

Kansas City, Mo.

BUILDING PERMITS.—John J. Green, brick dwell and store, East Eighth St.; cost, $10,000.

Standard Implement Company, alteration business block, 1312-1314 West Eleventh St.; cost, $6,000.

Standard Implement Company, five-and-a-half-st'y business block, 1316-1318 West Eleventh St.; cost, $30,000.

P. Small, frame block, Montgall Ave.; cost, $4,000.

Dr. S. E. Trott, brick dwell., 1313 Troost Ave.; cost, $5,000.

M. E. Jones, frame dwell., cor. Garfield and Pendleton Aves.; cost, $3,700.

Mrs. E. J. Railsback, brick and stone block, cor. Thirteenth and Jefferson Sts.; cost, $24,000.

Irving Qneal, brick block, Tracy Ave.; cost, $6,000.

Minneapolis, Minn.

BUILDING PERMITS.—P. G. Lameraux, two-st'y wood dwell., w s First Ave., bet. East Thirty-second and East Thirty-third Sts.; cost, $8,000.

P. G. Lameraux, two-st'y wood dwell., e s Nicollet Ave., bet. East Thirty-second and East Thirty-third Sts.; cost, $8,000.

P. G. Lameraux, two-st'y wood dwell., e s Nicollet Ave., bet. East Thirty-second and East Thirty-third Sts.; cost, $8,000.

P. G. Lameraux, two-st'y wood dwell., w s First Ave., bet. East Thirty-second and East Thirty-third Sts.; cost, $8,000.

P. G. Lameraux, two-st'y wood dwell. e s Nicollet Ave., bet. East Thirty-second and East Thirty-third Sts.; cost, $8,000.

P. G. Lameraux, two-st'y wood dwell., e s First Ave., bet. East Thirty-first and East Thirty-second Sts.; cost, $8,000.

Geo. H. Hoyt & Son, two-st'y wood dwell., e s East Fourteenth St., bet. Portland and Park Aves.; cost, $4,000.

Kenyon Bros., four-st'y brick store building, n s Washington Ave., bet. Thirteenth and Fourteenth Aves., s; cost, $12,000.

Woolf & Thomas, 4 three-st'y brick veneer tenements, w s Hennepin Ave., near Superior Ave., s; cost, $16,000.

Joel B. Clough, two-st'y wood dwell. and barn, n e cor. North Aldrich and Hawthorne Aves., n; cost, $4,000.

Calvin F. Brown, two-st'y wood dwell., e e Vine Pl., bet. West Nineteenth and West Twentieth Sts.; cost, $7,500.

Casey & Rand, two-st'y brick barn, e s Sixth Ave., bet. Tenth and Eleventh Sts., s; cost, $4,500.

Monroe and others, three-st'y brick store and flats, n e Fifth St., bet. Hennepin and First Aves., n; cost, $30,000.

U. S. Government, U. S. Government building, s e cor. First Ave. and Third St., s; cost, $500,000.

New York.

CHURCH.—Rev. Jarvis Warden has filed plans for a one-st'y church, n e Eighty-sixth St., 336′ e Second Ave. The church, which is to be used as a temporary place of worship, will cost about $3,000.

APARTMENT-HOUSES.—On the s w cor. of Lexington Ave. and Eighty-first St., 2 handsome five st'y basement apartment-houses, 40′ x 94′ 4″ and 40′ x 100′ 4″ of brick, brown-stone and terra-cotta, are to be built for Mr. Fred. Correll, at a cost of abt. $100,000; from plans of Mr. E. E. W. Schneider.

On the e s Second Ave., from Sixty-ninth to Seventieth St., 10 five-st'y brick and stone improved tenements, are to be built by Messrs. Higgins & Keating, at a cost of about $185,000; from plans of Messrs. A. B. Ogden & Son.

HOUSES.—On the s s Seventy-ninth St., 150′ w Ninth

Ave., 7 four-st'y and basement dwells., 22' and 24' x 60', of brick and stone in different styles of architecture are to be built for Mr. Samuel Colcord; from designs of Mr. H. L. Harris; estimated cost about $200,000.

On the s s One Hundred and Twentieth St., 150' e Ninth Ave., 8 three-st'y high stoop dwells., to cost abt. $75,000, are to be built from designs of Mr. D. T. Atwood.

STABLE.— For Mr. George Droste, five-st'y brick and stone front stable and warehouse, 25' x 80', is to be built on the n s Seventy-fifth St., 125' w First Ave.; from designs of Mr. Julius Kastner.

STORE.—On the w s Third Ave., bet. One Hundred and Twenty-first and One Hundred and Twenty-second Sts., a large three-st'y store building, is to be built from plans of Mr. I. R. Thomas, for the Reformed Dutch Church of Harlem, who expect to spend $125,000 on the improvement.

ST. PATRICK'S CATHEDRAL. — The contract for completing the spires of St. Patrick's Cathedral, has been awarded to Messrs. H. B. Hannah and Hamilton & Mann, of Baltimore. The cost of the work will be about $200,000. The New York *Herald* says that after waiting six years for its spires, St. Patrick's Cathedral will have them before winter comes. Upon the foundations for the spires will be built octagonal lanterns in two tiers, and upon the upper one will rest the spires themselves, which will also be octagonal. When completed they will tower 330' above the sidewalk.

BUILDING PERMITS.—*Thirty-first St.* n s, 225' w Sixth Ave., four-st'y brick stable, brick front, flat gravel roof; cost, $20,000; owners, Ryerson & Brown, 21 East Twelfth St.; architects, D. & J. Jardine, 1262 Broadway.

Ninety-fourth St., n s, 175' w Eighth Ave., 3 three-st'y brick and brown-stone dwells., brick and stone front, flat tin roof; cost, $20,000; owner, Thomas Auld, 232 West Fifty-fifth St.; architect, G. A. Schellinger, 128 Broadway.

Avenue B, s e cor. Eleventh St., 4 four-st'y brick stores and tenements, brick front, flat tin roofs; cost, $42,000; owner, Catharine Zimmerman, 13 West One Hundred and Thirty-fourth St.; architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.

Avenue A, w s, bet. Seventy-ninth and Eightieth Sts., 9 five-st'y tenements, brick front, flat tin roof; cost, $130,000; owner, Francis Schnigg, 19 Avenue A.; architect, Herter Bros., 314 East Forty-third St.

Second Ave., e s, 250' n Ogden Ave., (Highbridge), two-and-a-half-st'y frame dwell., peak shingle roof; cost, $5,000; owner, Angus McIntosh, Highbridge; architect, John E. Kirby, 115 Broadway.

Forty-first St., n s, 57' w First Ave., 3 five-st'y brick tenements; brick front, flat tin roof; cost, $60,000; owners, Dawson & Archer, 4 Prospect Pl.; architects, Thom & Wilson, 1267 Broadway.

One Hundred and Nineteenth St., n s, 510' w Fifth Ave., 3 three-st'y brick and brown-stone dwells., brown-stone front, flat tin roof; cost, $24,000; owner, E. O. Perrine, 308 West Twentieth St.; architect, J. E. Terhune, 218 West Thirty-seventh St.

One Hundred and Twentieth St., e s, 150' e Ninth Ave., 8 three-st'y and basement brick buildings, flat tin roof; cost, $56,000; owners, Smith & Crowley, 335 Broadway; architect, D. J. Atwood, 535 Broadway.

Suffolk St., Nos. 130-138, 4 five-st'y brick tenements, brick and sandstone front, flat tin roof; cost, $60,000; trustee, J. Coleman Drayton, 120 Broadway, architect, George B. Bost, 15 Cortlandt St.

Union Ave., s e cor. Home St., three-st'y frame dwell., flat tin roof; cost, $5,000; owner, Herman Girke, 537 East Eleventh St.; architect, W. W. Gardiner, 1364 Washington Ave.

One Hundred and Fifth St., s s, 225' e Tenth Ave., five-st'y brick flat, flat tin roof; cost, $30,000; owner, Louisea Schnoering, 338 Manhattan Ave., Brooklyn; architect, Wm. Graul, 12 Stanton St.

One Hundred and Fifth St., s s, 255' e Tenth Ave., five-st'y brick flat, flat tin roof; cost, $22,000; owner, Louisea Schnoering, 338 Manhattan Ave., Brooklyn; architect, Wm. Graul, 12 Stanton St.

Union Ave., e s, 250' s Home St., 9 three-st'y and basement frame dwells., flat tin roof; cost, $31,500; owner, Herman Gierke, 537 East Eleventh St.; architect, W. W. Gardiner, 1364 Washington Ave.

One Hundred and Forty-fifth St., n s, n w cor. First Ave., 9 three-st'y and basement brick and stone buildings, 1 four-st'y, flat tin roofs, brick front; cost, $90,000; four-st'y cost, $15,000; owner, P. J. O'Brien, One Hundred and Forty-third St., bet. Seventh and Eighth Aves.; architect, W. B. Anderson, 102 South Fifth Ave.

West Fiftieth St., No. 450, five-st'y brick tenement, brick and brown-stone front, flat tin roof; cost, $15,000; owner, Michael Lapp, 457 West Fiftieth St.; architect, R. H. B. Schneider, 15 Courtlandt St.

ALTERATIONS. — *St. Mark's Pl.*, No. 17, four-st'y and basement brick dwell., brick and marble front to be altered, the basement to be a lecture room, first st'y a chapel, upper stories dwell.; cost, $3,000; owner, Rev. Jacob Freshman, 25 Seventh St.; architect and builder, L. H. Williams, 2 West Fourteenth St.

Madison Ave., No. 315, five-st'y brick dwell., stone front, to have an extension, 2 stores to be built of brick, owner, Mrs. M. R. Watson, 315 Madison Ave.; architect, W. H. Clum, Plainfield, N. J.

Philadelphia.

BUILDING PERMITS.— *Twenty-sixth St.*, cor. Oxford St., three-st'y store, 17' x 47'; Wm. H. Rea & Son, contractors.

Melrose St., w Fifty-seventh St., two-st'y stable, 17' x 40'; Jno. E. Sickel, contractor.

Church St., w Twenty-seventh St., two-st'y stable, 18' 6" x 30'; Helbach & Auchlen, contractors.

Mt. Pleasant St., w Twenty-seventh St., two-st'y dwell., 16' 4" x 40'; Helbach & Auchlen, contractors.

Ridge Ave., n e cor. Noble St., five-st'y store, 55' x 68'; Lewis & Bro., owners.

Laurel St., w New Market St., ice-house, 17' x 40'; Wm. Moland & Son, owners.

Connarow St., w Pechin St., 2 two-st'y dwells., 16' x 42'; L. Rowland, contractor.

Stenton Ave., Nos. 4 and 6, 2 three-st'y dwells., 17' x 32'; Edward Welch, contractor.

Warren St., s e cor. Thirty-sixth St., three-st'y dwell., 27' x 41'; Martin Christ, contractor.

Hazzard St., e Kensington Ave., 4 two-st'y dwells., 15' x 30'; J. I. Bradfield, owner.

Jefferson St., No. 423, three-st'y ice-house; August Vollmer, owner.

Spencer St., w Thirty-seventh St., 6 three-st'y dwells., 15' x 47'; Jacob Glease, contractor.

Twenty-third St., s Washington St., two-st'y shop; Jas. McHenry, owner.

Bridge St., cor. Richmond St., two-st'y store, 17' x 50'; Amos Linn, owner.

South St., w Sixty-first St., 3 three-st'y dwells., 15' x 35'; Jacob Zell, owner.

Noble St., w Ninth St., 2 three-st'y dwells., 15' x 40'; P. Thompson, contractor.

Twenty-third St., n w cor. Christian St., stable, 46' x 130'; C. Lafferty, owner.

Centre St., bet. Wilson St. and R. R., 2 two-st'y dwells., 16' x 45'; W. A. Ford, contractor.

Seybert St., w Twenty-third St., 4 two-st'y dwells., 14' x 28'; Geo. Gibson, owner.

Ridge Ave., cor. Stiles St., three-st'y store; Wm. Harrison, contractor.

South Fourth St., No. 922, three-st'y shop; Geo. C. Jackson, owner.

Main St., w Robinson St., 3 three-st'y dwells., Robt. Manley, owner.

Seventeenth St., n Venango St., 11 two-st'y dwells.; J. B. Carr.

Federal St., No. 1227, three-st'y dwell., 17' x 30'; Rea & Riley, contractors.

Federal St., No. 1227, two-st'y stable, 17' x 125'; Rea & Riley, contractor.

Eighth St., above Dauphin St., three-st'y dwell., 20' x 45'; Jno. Weible.

St. Louis.

BUILDING PERMITS.—Sixty-seven permits have been issued since our last report, fifteen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

N. C. Harris, agent, 2 adjacent two-st'y brick dwells.; cost, $5,500; Gravel & Weber, architects; S. C. McCormack & Son, contractor.

Mrs. M. A. Gelivicks, two-st'y brick dwell.; cost, $3,000; G. W. Pipe, architect.

Mrs. L. Trafts, two-st'y brick dwell.; cost, $2,800; S. Stricker, contractor.

John Ganahl, altering two-st'y brick dwell.; cost, $4,000; Geo. I. Barnett & Co., architects; Paulus & Weidermuller, contractors.

F. Zimmermann, two-st'y brick dwell.; cost, $3,500; A. Beinke, architect; C. Linnenkohl & Co., contractors.

Wm. Keane, one-and-a-half-st'y brick boarding stable; cost, $2,500; J. H. O'Brien, contractor.

Casey & Leeson, two-st'y brick shirt factory; cost, $2,500; Chapman & Thursby, contractors.

A. W. Davis, two-st'y brick dwell.; cost, $2,500; Marlatt & Johnson, contractors.

W. Jennison, two-st'y brick tenement; cost, $2,800; Wm. Cochran, contractor.

Julius Walsh, Pres., one-st'y brick car stable; cost, $2,200; Wm. Cochran, contractor.

J. D. Galvin, two-st'y brick dwell.; cost, $3,500; T. F. Marley, contractor.

E. Schiwitz, two-st'y brick dwell.; cost, $3,400; Henry Reimer, contractor.

Alex. Dafferty, two-st'y brick dwell.; cost, $2,800; Ed. Mackey, contractor.

Wm. Stuckelmeyer, two-st'y brick tenement; cost, $2,810; G. Ibers, contractor.

Wm. Kempel, two-st'y brick dwell.; cost, $2,500; O. Koenig, architect; A. H. Haeseler, contractor.

Ed. Keller, two-st'y brick dwell.; cost, $3,900; J. L. Knhnert, contractor.

Miss Mary Slattery, two-st'y brick dwell.; cost, $3,100; A. Wagner, contractor.

St. Paul, Minn.

BUILDING PERMITS.—Two-st'y frame store, n s Decatur St., bet. Bedford and Preble Sts; cost, $2,000.

Two-st'y frame dwell., w s Walker St., bet. Taylor St. and St. P. & M. & M. R. R.; cost, $1,800; owner, John Roland.

Two-st'y frame dwell., s s Payne St., bet. Farquier & R. R.; cost, $1,000; owners, Kate and Bridget Barrett.

Two-st'y brick store and offices, s s East Fourth St., bet. Robert and Minnesota Sts.; cost, $2,000; owner, C. F. Clark.

Five-st'y brick business block of stores, w s Sibly St., bet. Fifth and Sixth Sts.; cost, $25,000; owner, Manrice Lyons.

Three-st'y addition to Madison School-House, n s Martin St., bet. Wabasha and Park Ave.; cost, $11,700; owner, Board of Education.

Two-st'y frame dwell., e s State St., bet. Robie and Winnifred Sts.; cost, $5,000, owner, E. R. Byrant.

Two-st'y frame dwell., s s Fuller St., bet. Virginia and Western Ave.; cost, $2,475; owner, Wm. M. A. Smith.

Toledo.

IN GENERAL. — The local building outlook is only fair, and the season now closing shows moderately gratifying results. Too many would-be contractors are ever in the field, consequently there is too much hasty and careless work done. There seems to be too many competitors (such as they are) in building all over the country, and the consequence is the standard of work and taste is not elevated or advanced nearly as rapidly as it would seem it ought to be.

ASYLUM.—The large asylum contract here by Malone & Co. is being vigorously pushed by them. It is hoped that the close of 1886 will see all of the upwards of forty buildings very near completion.

STABLES. — *Woodruff Ave.*, brick stable, for L. S. Baumgardner; cost, $3,000; N. B. Bacon, architect; Gross & Monroe, builders.

Madison St., brick stable for S. C. Reynolds; cost, about $4,500; N. B. Bacon, architect; Jno. W. Lee, builder.

Ashland Ave., stables for J. H. Bowman; cost, about $1,800; N. B. Bacon, architect.

HOUSES. — *Franklin Ave.*, two-st'y frame dwell., for M. Neuhausel; cost, about $4,500; E. O. Fallis & Co., architects.

Washington St., cor. Seventeenth St., two-st'y frame dwell. and stable for Dr. O. S. Brigham; cost, $5,000; N. B. Bacon, architect; H. E. Brown, builder.

Jefferson St., cor. Tenth St., three-st'y brick dwell. for Dr. Melchers; cost, about $8,000; A. Liebold, architect.

Illinois St., block of 5 two-st'y frame dwells., for J. W. Myers; cost, about $7,500; A. Wales, builder; N. B. Bacon, architect.

Seventeenth St., cor. Jefferson St., three-st'y frame dwell. for Dr. H. A. Chase; cost, about $6,500; N. B. Bacon, architect; H. E. Brown, builder.

General Notes.

BIRMINGHAM, ALA.—The following building permits have been issued since our last report:—

Two-st'y frame dwell. for Robert Jennison, Esq.; cost, $5,500; H. Wolters, architect.

Four-st'y brick business house, for J. T. Wilson; cost, $14,000; Oliver Marble & Son, architects.

Two-st'y frame dwell. for Geo. Morris; cost, $3,000; T. C. Thompson & Co., builders; Chas. Wheelock, architect.

Two-st'y cast-iron front business house for Walker & Mudd; cost, $4,000; T. C. Thompson & Co., builders; Chas. Wheelock, architect.

Birmingham public school building, two-st'y of brick and stone; cost, $9,500; Chas. Wheelock, architect.

HANOVER, N. H.— Miss Kate Sanborn asks the graduates of Dartmouth to contribute money for building an alumni art gallery and memorial hall here.

HARTFORD, CONN.—The South school building committee have made preparation for letting contracts and getting the work on the building fairly started.

HUTCHINSON, KAN.— Everything concerning the locating of the reformatory here is now completed. The architect will have the plans and specifications in about three weeks, when work will be commenced on the excavation for the basement.

LYNN, MASS.—General Lander Post No. 5, of Lynn, has voted to appropriate $25,000 for the erection of a new building on Andrews Street.

NASHUA, N. H.— The city goverment have voted unanimously to exempt from taxes the proposed new building for the Moody & Estabrooks shoe manufactory for ten years.

RICHMOND, VA.— An interesting question has arisen in the Treasury Department in regard to the custom house at Richmond, Va. An act of Congress, approved February 26, 1885, appropriates $100,000 for the enlargement of the building. The sundry civil bill, which was approved March 3, 1885, appropriates $50,000 for the same purpose. The Supervising Architect has asked for instructions in the matter before prepairing plans and specifications for the building. He is undecided as to whether he shall prepare designs for a building to cost $100,000 or for a building to cost $50,000. The question has been referred to the legal officers of the department for an opinion.— *Goverment Advertiser.*

TECUMSEH, MICH. — Two-st'y frame dwell., for Mrs P. R. Adams; cost, about $6,000; N. B. Bacon, architect, Toledo, O.; T. H. Crane, builder.

UPPER SANDUSKY, O.— Two-st'y frame dwell. for T. E. Grissel; cost, about $3,000; N. B. Bacon, architect, Toledo, O.

WAKEFIELD, MASS.— A number of gentlemen interested in real estate have purchased what is known as the Nash farm, on the west side of the Boston and Maine Railroad and south of the Greenwood Station in Wakefield, and propose laying it out into house lots. The farm comprises about one hundred and sixty acres, the location is one of the best as to prospect and healthy surroundings, and there is every reason to anticipate a flourishing settlement. There will probably be built about fifty houses, and upon their completion a new station will be placed at this location by the Maine Railroad. The wood on the farm will furnish a great portion of the lumber, and already a large saw mill has been erected upon the grounds and a gang of men are busily at work. Thirty thousand feet of boards have been sawed, and it is thought that the total outcome will be about 400,000 feet of boards and about four hundred cords of wood.— *Boston Journal.*

WOODBURY, N. J.—Corner of Broad Street and Delaware Ave., court-house for Gloucester County, 65' 6" x 92' 9", will be built of stone, to be fire-proof, heated and ventilated by steam, will contain county offices, court-rooms, etc. This design was selected by the Board from fifteen competitive designs from architects in surrounding States; Hazlehurst & Huckel, architects.

Bids and Contracts.

BALTIMORE, MD.— The following is an abstract of the bids for iron beams for the post-office:—

H. A. Ramsey & Son, Baltimore, Md., $3,745.
Dearborn Foundry Company, Chicago, Ill., $3,980.
Bartlett, Hayward & Co., Baltimore, Md., $4,100.
Snead & Co. (Iron Works, Louisville, Ky., $4,137.
Phœnix Iron Company, Trenton, N. J., $4,635.
Haugh, Ketcham & Co., Indianapolis, Ind., $4,865.
H. A. Ramsey & Son, have been awarded the contract for iron beams, etc., for the fourth-st'y floor of the post-office.

CLEVELAND, O.—The following is an abstract of the proposals for supplying standard and special furniture required for the United States custom-house building:—

Edward E. Swiney, Chicago, Ill., $11,937.05.
H. J. Fitzpatrick & Co., New York, $10,759.66.
A. H. Andrews & Co., Chicago, Ill., $9,212.55.
Tomlinson & Carsley, Chicago, Ill., $413.51.
Ernest Feige, East Saginaw, Mich., $10,017.75.
The Robert Mitchell Furniture Company, Cincinnati, O., $9,963.55.
Phœnix Furniture Company, Grand Rapids, Mich., $10,690.90.
Pullman's Palace Car Company, Pullman, Ill., $8,702.01 (*accepted*).
Thomas Kane & Co., Chicago, Ill., $9,500.

CONCORD, N. H.— The contract for brick masonry of basement and superstructure of the post-office and court-house has been awarded to Meade, Mason &



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The Cathedral

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Mexico, Mexico.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 509.

SEPTEMBER 26, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE designs for the memorial to General Grant, which we publish this week. submitted in response to our invitation of a few weeks since, should be considered simply as the suggestions of their respective authors; that is, the competition was one of ideas and not of draughtsmanship, and the inequalities of presentation should be taken as simply an indication of what the several authors understand by "preliminary sketches." While we feel that the few who have taken part in the competition have not only done creditably, but have shown a capacity of responding to an appeal made to their generosity and patriotism, we cannot but fear that should the public ever learn the ratio that exists between the number of those who did and those who might have taken part in such a competition as this it will feel that the claims of the profession to be consulted in matters of monumental design rest rather on wordy assertion than on well-established evidence of capacity. If the many architects who have been writing to the papers and to the New York Grant Committee had only thought it worth while to send in answer to our appeal — which was taken up by the daily press all over the country, so that it is only fair to assume that the designs published to-day will attract widespread attention — their second-best ideas, keeping their very best ones sacred for an actual competition, we believe it would have been better for the reputation of the profession in this country.

THE Chicago *Building Budget* prints as a supplement a full report of the deliberations of the recent semi-annual convention of the Iowa Architectural Association, some of which is interesting and valuable to all architects. Much of the time of the Convention was occupied in discussing the best forms of contract between owner and builder, and between owner and architect, and many useful suggestions were made. The form of agreement between owner and architect was first taken up, and although the *Building Budget* does not give the text of the form finally adopted, we learn from the report of the discussion that it contains a promise of the owner to pay for the use of drawings and specifications, and for general superintendence, the rates established by the American Institute of Architects, with extra payment in case of "material changes in the plans, elevations and details, after the same have been fully agreed upon and approved," and also in case of the delay of the completion of the building beyond the contract time. The former of these stipulations forms a part of most agreements between owners and architects, and would probably be held in any court to be always implied, but the latter is, so far as we know, quite new. The reasons given for it in the Convention were, in brief, that by the failure of the builder to complete his work within the given time the architect was often obliged to continue his visits of superintendence unreasonably beyond the period contemplated at the beginning of the work, at an expense to himself, and often to the very serious detriment of his business, inasmuch as all architects of considerable practice are obliged to lay out their work so that their commissions shall take turns in claiming their serious attention. In a few cases, where a definite delay can be foreseen, the architect is able to dismiss the work temporarily from his mind, and devote himself to something else, but these instances are rare, and if the architect does what he can to facilitate the progress of the building, it is only fair that he should be paid a reasonable remuneration in case he is put to extra trouble and expense to suit some one else's convenience. One of the gentlemen present remarked that he had, in his own practice, sometimes added a stipulation to the contract between the owner and builder, to the effect that the latter should, in case of delay beyond the specified time of completion, pay, or forfeit from the amount due him, reasonable extra fees to the architect; and had collected fees so forfeited; but the sentiment of the meeting seems to have been, as might be expected, that such extra payments should be made to the architect by the owner, who could collect them from the builder, together with his other losses by the delay, under the usual liquidated damages clause.

THE subject of the contract between owner and builder was less discussed, as time pressed, but some interesting points were raised. It seems to be the case in Iowa, as elsewhere, that builders dislike to sign contracts binding them to a forfeiture in case of delay, and try to avoid it if possible, or at least to get some equivalent stipulation inserted for their own benefit, requiring the owner to be prompt in his payments to them. The contract adopted by the Association seems to have contained a clause of this kind, which might, we think, be better omitted. It is true that hardship is often suffered by builders who, under the usual form, find themselves compelled to pay forfeitures for delays which may have been caused by the whims and indecision of the owner himself, or by something else which could not have been provided against; but the best remedy for this is not to retaliate upon the owner with annoying and useless stipulations, but to insert a proviso in the forfeiture clause to the effect that the forfeiture for delay shall not be exacted if in the opinion of the architect the delay shall have been due to causes which could not have been foreseen or avoided by the exercise of reasonable care and diligence on the part of the builder. Such a proviso rather favors the owner, since it expressly gives to the architect, instead of a jury, the right to decide whether the delay, if any should occur, is chargeable to neglect on the part of the builder, but it protects the latter against the possibility of having either to submit to injustice, or betake himself to the courts for relief, and we have never known any hesitation to be shown by either party in signing a contract so expressed; while an attempt to compensate the builder for the opportunity which the common forfeiture clause gives for oppressing him, by inserting other clauses under which he can annoy the owner, would be likely to meet with serious resistance on the part of clients experienced in building matters. The stipulation sometimes demanded by builders, that they shall be paid a premium for every day that the work is completed before the specified time, equal in amount to the forfeiture for delay beyond it, is obviously impracticable in most cases, and anything in the nature of a forfeiture imposed upon the owner for delay in making payments is not only needless, since the builder is assisted by all the inequitable privileges of the lien laws in collecting his pay at any time, with interest from the date of the architect's certificate, but is calculated to give more trouble to the architect himself than to any one else, since it does away with his authority in deciding one of the most serious, but most common disputes between the two parties to the contract, at the same time that it opens the door to endless petty quarrels in which the architect receives most of the blows from both sides.

TO the *soi-disant* utilitarian Americans it would seem the height of folly for the administration of a colony in the midst of a barbarous country to employ architects to design and direct the construction of the buildings which it is found necessary to erect; and even the English officials, who take pains to show, by their tyrannical incivility to the best members of the profession, how little they care for their services, must experience a spasm of derision at learning that the French colonial Government of Cochin China has determined to employ a certain number of architects, to be attached to the administration of public buildings, and has invited applications for the positions which it has to offer. Ludicrous as it may

seem to an English Commissioner of Public Works, the Governor of Cochin China sees fit to require that all candidates for appointments in the architectural service shall have been educated at the Ecole des Beaux-Arts, and their applications must be accompanied by a certificate to that effect, as an essential document. Next to this in importance is a recommendation from an architect of reputation; and certificates of good health and good morals are also required. Once appointed, the official architects of Cochin China are to be well paid. The complete staff will consist of a chief architect, an assistant, one or more inspectors of the first class, others of the second class, and sub-inspectors of two classes. The chief architect and his assistant will be stationed at Saigon, the capital of the colony. The former is to be paid three thousand seven hundred and ninety-six dollars a year, and the latter two thousand and ninety-eight dollars. The inspectors are to spend their time wherever their services are needed, and are to receive nineteen hundred and eight, and seventeen hundred and twelve dollars respectively for those of the first and second class, so long as they are at work in Saigon, with an addition to their salary of something more than one-third when their duties call them to the interior. After three consecutive years of service, each member of the architectural staff is entitled to six months' leave of absence, with two-thirds of his full pay; and in case of illness he may, if necessary for the restoration of his health, be allowed suitable sick leave, on full pay.

A DISAGREEABLE accident occurred the other day in London, where a sewer, gorged with storm-water from a heavy shower, burst, just where it passed under the Sloane Square station of the Metropolitan Railway. In half an hour after the accident the water stood nearly four feet deep over the railway tracks, and was still coming in. Great efforts were made to stop the flow and drain the tracks, but it was not until nine o'clock the next day, seventeen hours after the break occurred, that the water was sufficiently lowered to allow trains to run over the line.

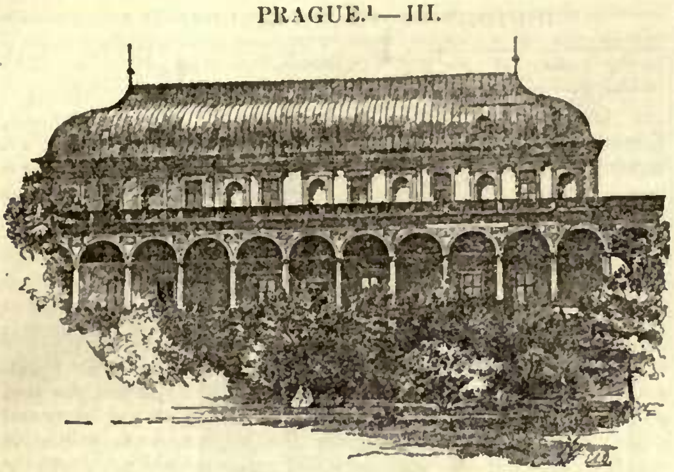
A PUMP has, according to *Le Génie Civil*, been invented and set up in Paris, which depends for motive power entirely upon the heat of the sun. This curious invention, which is due to M. Tellier, an engineer of distinction, may be described briefly as consisting of a sort of pulsometer, actuated by the vapor of ammonia, which is disengaged from solution in water, and raised to a sufficient tension, by exposure to the sun's rays in thin, flat cases of sheet-iron. At M. Tellier's house the iron generators, or boilers, if we choose to call them so, are made of pairs of plates, held a fraction of an inch apart by means of separators, and riveted around the edges, and ten of these are set so as to form the roof of a chicken-house which faces the south. The heat of the sun sets free ammoniacal vapors, which collect in the upper part of the hollow roof, and are thence conveyed by a pipe to a sort of steam drum, consisting of a small cylindrical box, placed near. A drip pipe from the bottom of the box returns any condensed liquid to the lower portion of the hollow roof, while the dry vapor is carried by another pipe into a well not far off. Under the surface of the water in the well is a hollow sphere, with a loose rubber diaphragm in the middle. The lower half of the sphere communicates with the water, and the upper with the ammonia pipe. So long as the apparatus is quiescent the sphere is full of water, but on the introduction of the vapor under pressure above the diaphragm the water is driven out, and, by a simple arrangement of check valves, is forced upward into a tank, instead of running back into the well. The ammonia enters the sphere through a slide valve, the spindle of which is attached to the centre of the diaphragm, and when all the water is pushed out of the sphere, the distension of the diaphragm closes the entrance part of the slide valve, and opens the exhaust, allowing the ammonia to escape, and the sphere to refill with water, when the same process is repeated. The most efficient service of the pumps would probably be obtained by allowing the exhaust vapor to waste into the atmosphere, but in order to save the ammonia M. Tellier carries the vapor into a condensing chamber, cooled by the water of the well, where it is reduced to a liquid form, and pumped back into the hollow roof. Considering the loss of power involved in this second pumping, the efficiency of the whole apparatus is surprising. Each section of the hollow roof has an area of about forty square feet, making a total of four hundred square feet, and in ordinary summer weather this will raise three hundred gallons an hour to the surface of the ground, from a depth of sixty feet. As the source of the heat does not affect the result, it seems as if this device might be utilized to advantage in many places where there is a surplus of artificial warmth. The ceiling of a boiler-house, for example, might be covered with hollow plates at a small expense, and the heat employed to pump water into feeding tanks or wherever else it may be wanted.

THE building of the enormous Forth Bridge, according to the *British Architect*, proceeds steadily, the masonry of the southern end, including the piers of the approach viaduct and the huge cantilever pier, being completed, while the stonework on Inchgarvie Island, the intermediate station, is nearly done. At the south end much of the iron-work has been put together, and is nearly ready for hoisting into place, while the iron bolts which secure it to the masonry are all ready to receive it. It is worth remembering that each of the two principal spans of this bridge is more than seventeen hundred feet, and a certain additional interest has lately been given to the work by the efforts of an engineer of some reputation, who has convinced himself that the bridge, as designed, is insecure, and will probably fall, and thinks it his duty to explain his convictions, and the reasons for them, to other people. We do not pretend to say whether his criticisms of the design are well founded, but there is a certain consistency to them which seems to render them worthy of attention. If, however, they are to be proved correct, we hope that the test may be made before any danger is incurred. We do not know whether the American system of testing the best railway bridges, by loading them with locomotives, placed one behind another over the whole length of the bridge, is in vogue in Great Britain, but something of the kind should be enforced before the structure is opened to traffic.

ACCORDING to the *Builder*, the number of historic estates for sale in England continues to increase. One of the latest to be put on the market is the manor of Ankerwycke, an estate of seven hundred acres on the Thames, near London. The estate is bounded by the river for more than two miles, and includes within its limits is the little island on which King John signed the Great Charter in the year 1215, after a threatening demonstration from the barons of his kingdom assembled on the plain of Runnymede, on the opposite side of the river. Besides this interesting place, the estate contains the ruins of a Benedictine convent, founded in the reign of Henry II, and also a famous yew-tree, under which King Henry the Eighth is said to have had many meetings with Anne Boleyn. There are few estates of seven hundred acres near London which would not afford some special historical interest, but this one, combining the memories of the first, the last, and the meanest of the Plantagenets, is particularly fortunate.

A GREAT deal of information, mixed with misinformation, is in circulation in regard to the Asiatic Cholera, which is now raging in Spain with terrible severity, and may at any moment make its appearance in this country. A case is said to have already occurred in England, where the victim drank water which had been brought in the fresh water casks of a ship from Barcelona; and some such unsuspected mode of infection as this may distribute the disease very widely in a few days. It is worth remembering, however, that the approach of the pestilence is usually indicated by an unusual prevalence of enteric diseases, as if a haze of predisposition went before the storm of the plague itself; and Sir Robert Rawlinson observes further that during the prevalence of the epidemic all other diseases are, so to speak, swallowed up by the cholera, which results immediately from chills and indigestions that would in ordinary times be followed by quite different symptoms. The efficacy of the Ferran inoculations is still disputed. At one time a rumor was circulated that the inoculation was worse than useless, and that Dr. Ferran had been compelled to discontinue his work; but a subsequent report, from certain physicians who went from England to Spain to observe the effects of the practice, seem to show that the Ferran's inoculation is at least as effective in preventing cholera as vaccination is in keeping off small-pox during violent epidemics.

PRAGUE.[1] — III.



The Belvedere, Prague.

NO building in Prague is more famous than the little synagogue. The Jews' quarter is now shared between the Jews themselves and the poorest class of Christians, but except for the intermingling of blond heads in the narrow streets, and for a modern degree of cleanliness, its old-time aspect is pretty well preserved, and has often been described. Who has not read, for instance, of the extraordinary graveyard, disused since the year 1780 — disused per force, since, we are told, five or six layers of tombs already rested one above the other and since, as we see, the gray stones are crowded in close ranks with scarce an inch of space between what may be called a grave? It is a strange, sad, dilapidated looking place, yet wierdly picturesque in its dense, wild overgrowth of elder bushes, especially when they cover it in spring with their canopy of snowy bloom.

There are a number of synagogues in the quarter, but none of interest save the oldest, oddly called the Alt-Neu-Schule. Endless are the various legends which have been held as truths respecting it. Not merely the site but the existing structure has been given a vast antiquity. Even those who do not say that it was miraculously transported from the Holy Land, or dug out ready-made from the side of a Bohemian hill, would have us think that it is the oldest Jewish place of worship in the world except some portions of the temple at Jerusalem; that it was built immediately after the dispersion of the race; that it long antedates in consequence the introduction of Christianity into Bohemia — even Goethe wrote of it that it could not be later than the eighth century; all of which only proves how recent a science is the interpretation of mediæval forms. For the synagogue is not Romanesque or even transitional in style — it is a pure and fully-developed though simple Pointed structure. Its simplicity and the general course of architectural history in Bohemia make it difficult to assign it an exact date, but it cannot be earlier than the second half of the twelfth century or later than the first half of the thirteenth. Kugler inclines to the earlier, and Quast and Schnaase to the later of these two periods. At all events it was constructed after the Pointed style had been perfectly formulated, and before the so-called "Avignon School," led as we have seen by Matthew of Arras and Peter Parler, had engrafted French fashions upon the local manner. There is nothing French here — it would be difficult, indeed, to find a more perfect little example of the essentially German way of building — of the *hallen-bau* with its aisles of equal height. The exterior is very plain, and its buttresses and vestibules are later additions. From one of the latter we enter the synagogue through a beautiful, small, acutely pointed doorway with many mouldings, but with little sculpture save in the shape of a charmingly designed vine, typical of the Tree of Life, which fills the tympanum. The synagogue itself is a rectangular room 45′ x 27′, with two tall lancet windows in each of the longer sides. It is divided into three aisles by two slender octagonal columns, and roofed with pointed vaulting. The columns have no true capitals but the vaulting ribs which spring from them are supported on a circle of consoles that give a capital-like effect. Similar consoles bear, at the same height, the ribs which abut upon the walls, while engaged shafts support these again, themselves resting on a sort of string-course that runs at a distance of some eight feet above the floor. Other architectural details there are none save a square-headed door, surmounted by a rich triangular pediment which marks the closet where the sacred rolls are kept.[2] Wooden seats encircle the wall, and also run around a central rectangle, formed by a high iron railing within which, between the two columns, are the reading-desks. Innumerable brass lamps hang from the ceiling, and show the most curious and beautiful shapes. And over the desks from column to column stretches a great red pennon, given as a token of gratitude to the Jews for the heroic part they played in the defence of the city against the Swedes. This defence, the bloodiest scene of which was enacted on the bridge, marked the close of the great thirty years' struggle — and quite fittingly, since, as I have been told, the signal for its outbreak was also given in Prague. But if this flag tells a tale of brotherly accord between Jew and Christian, the general history of the synagogue is a very different tale — is the same story of persecutions, robberies and massacres, that we find recorded everywhere in Europe, but nowhere in more sanguinary lines than here. From mediæval days down to the days of the great Frederic's invasion, one spoliation, one slaughter succeeded another. The worst was wrought perhaps toward the end of the sixteenth century, when the synagogue was piled with corpses, and the walls splashed high and dark with blood. Once and again and many times, so the story runs, they were painted and whitewashed in the effort to obliterate the stains. But always in vain until the Rabbis were convinced that the effort was impious, and that the blood-marks were destined to remain as a witness against the Gentile. At all events it seems certain that for nearly three centuries after the year 1592, nothing was done to the interior even in the way of cleaning the walls and vaults. And every traveller blessed the fact, since, as its result, the synagogue had a mysterious gloominess, a dusky richness of tone, a visible, palpable hoariness and antiquity of aspect that were quite unmatched elsewhere. It was the tone not of faded coloring, but simply of damp and dust and cobwebs and ages of smoke from lamp and candle; yet it was a tone that color might despair of rivalling. In spite of the very small size of the interior it was almost overwhelmingly impressive; one seemed to read the whole story of mediæval Judaism in the dirt and duskiness, and to breathe-in the very breath of Hebrew melancholy, pathos, fortitude, fanaticism, with its heavy incense-laden air. Nothing but an ancient Jewish sanctuary, we felt, could have had such a look; and just this look and no other should by rights an ancient Jewish sanctuary wear. Its smallness actually increased its impressiveness—wide spans would have been as inappropriate as full light or cheerful color to the holy place of the down-trodden, crushed, mysterious people. Just a touch of color and brightness was given by the great red flag, and the innumerable brazen lamps; just enough to make the pictorial effect quite perfect without injuring the sentiment of the whole. If, in short, one cared for expression in a building here one certainly found it in absolute perfection. Alas! that I should be writing in the past tense. This was still the synagogue when I first saw it a few years ago, but this it is no longer. It, too—it, of all things in the world—has lately been in the hands of the renovator. Fortunately I need not say of the re-decorator. No painting or decorating has been attempted, but the whole place has been thoroughly cleaned, the walls and vaults and columns scraped to the bare stone, and the surface of the stone itself worked over in many parts. The old tone is entirely gone, and with it the old charm, the old impressiveness, the mystery, the pictorial beauty, the hoariness which was so marked that one could hardly wonder at those who spoke of eighteen centuries of existence. As a mere architectural object, the synagogue is still very interesting, as I began by saying; it is so beautifully proportioned that it is noble in despite of its small size; and it is so simple in its harmony, so rigorous in its gracefulness, that it is more than a thing worth seeing — it is a thing worth studying. But it is no longer the interior so many more eloquent pens than mine have so often been at a loss for words to characterize. The blood-stains are gone at last, and with them the spell of mingled ocular and historic charm, which entranced even the verist Philistine among travellers. The architect should not omit to see the synagogue to-day; but the "sentimental tourist" need no longer make — as he so often made in other days—a pilgrimage thither in the hope of an emotional experience as unique as profound and unforgetable.

Another famous and interesting sanctuary is the Thein-Kirche, which holds a conspicuous station on the Alt-Stadt market-place. It was founded in early times by the German merchants of Prague, and stood close by their public warehouse or exchange. Such magazines were fortified in those stormy days, and hence the church's name, "*thein*" signifying a palisade. It is impossible here even to hint at the history of the Thein-Kirche, which was often rebuilt in whole or in part, and constantly passed from one sect to another during the long religious conflict. It was, indeed, the very centre of the whirlpool, and endless are the curious, the pathetic, the picturesque or bloody scenes which were enacted within its walls. The present structure dates from the first half of the fifteenth century. It is a three-aisled structure, very wide as compared with its length, without transepts but with three apses. The four-sided end of the central apse, together with other constructive details, seems to speak of the survival of Peter Parler's influence. The roof, with very flat vaulting, is an early seventeenth-century restoration, and the upper courses of the wall were evidently sacrificed when it was built. At the same time the whole interior was whitewashed, to the obliteration of many ancient frescos. In spite of all this the effect is fine, both architecturally and pictorially. The tone is warm and mellow, and there are scores of interesting details in the way of tombs and brasses and other sculptures.

On the exterior, the church shows its lofty west window over the low houses which crowd about its base and conceal its sculptured doors. The towers and spires are of a type which seems more suitable to civic than to ecclesiastical construction; yet since it is a peculiarly Bohemian type, and since the church had so prominent a part to play in the local wars and quarrels, they are expressionally most appropriate, as well as picturesquely most delightful. The north spire is original; the other was rebuilt in the present century, after a lightning-stroke, but its newness is not apparent to the eye. The most interesting feature of the exterior we find on the north side: a

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[1] Continued from page 138, No. 508.

[2] There seems good ground to believe that the Prague synagogue was inspired by an older one at Ratisbon, which was burned in 1519, but the interior of which is plainly shown in a print by Albrecht Altdorfer. Its design is the same as that of the Alt-Neu-Schule, but is executed with the round arch throughout.

richly-sculptured portal of a character which might well confuse a student unacquainted with the eccentricities of the latest phase of Bohemian Gothic; for round and pointed arches are both used in its elaborate design, and the detail, too, is of curiously contrasted kinds, some of it looking more like Tudor work than like anything we are accustomed to seeing on the Continent. Yet with all these peculiarities the portal would not look in the least eccentric save to a professional eye; on the contrary it is very harmonious, and so beautiful, despite its great dilapidation, that we may call it, I think, the finest piece of architectural detail in the city, so beautiful that we cannot but mourn once more over the threatened advent of the rejuvenator.

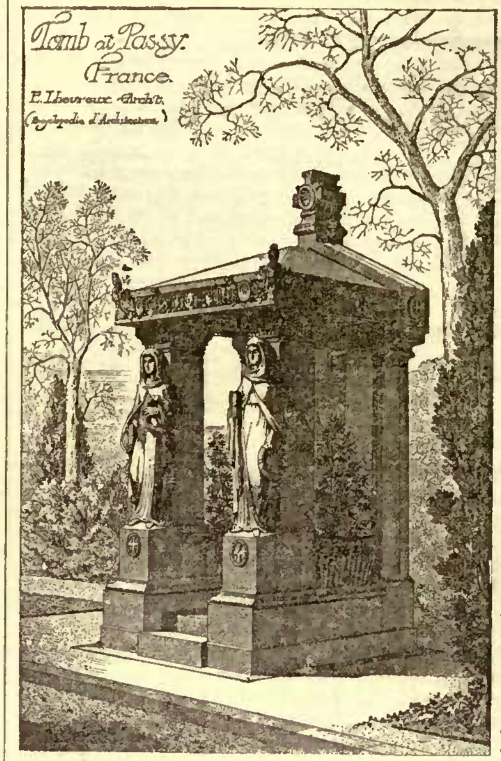
The last day we spent in Prague was Corpus Christi. All the churches were open and it was possible, therefore, to see some of the many Renaissance and Baroque interiors under the best possible conditions, to snatch a hasty glance through the crowded portals, and find them filled with brightly-dressed worshippers, ringing with organ strains, and veiled in clouds of incense. I remember one in particular, where the scenic effect was of the most splendid sort: a huge Baroque building, very elaborate yet not running to the most fantastic extreme, and apparently all of pink marble and gilded bronze. It is true that the marble was imitation, but at least it was not paint: in color and surface and lustre it was deceptively perfect, and while under the charm of its rosy glow one was ready to confess that if the builders of that day were neither great architects nor great decorators, they were at all events masters of the art of sensuous display and ecclesiastical pomp. And one real decorator there was in the last century at Prague, one whose name should be less wholly forgotten than it is. We are used to being told that the true fresco painting was a lost art in the German empire in the eighteenth century — had been so long a lost art that the colony of German painters who worked in Rome during the first two decades of our own deserve everlasting gratitude for its "rediscovery." But in Prague, at all events, it was not a lost art, as Reimer's decorations show. They were executed toward the end of the last century, in various palaces and churches, and they prove that he was faithful not only in his process, but also in his temper and his conceptions, to the great old Italian tradition. They are extremely interesting as survivals, as last echoes of the lost "grand manner" of decoration; and they are not without intrinsic interest too. The draughtsmanship is such as many a famous modern might gaze upon with envy, the huge architectural perspectives and the bold foreshortenings being managed with much skill and great apparent ease. And the coloring, although it is apt to run too much into a brown tone, has a distinctly decorative value.

Among the Renaissance buildings of Prague is the beautiful summer palace called the Belvedere. It was built by an Italian architect, Paolo della Stella, in the middle of the sixteenth century, and is almost unmatched in all the north of Europe for its purity of design and delicacy of ornamentation. The roof, which is copper and now of the highest green color, looks like a much later addition, and though it is extremely picturesque is hardly in keeping with the body of the structure. The palace stands in an immense garden, once considered the finest in the empire, and from its balcony we get a superb view of the Hradschin close above us. Not far away is the best of the many great private palaces of Prague, built by the great Wallenstein, and still inhabited by his family. The loggia which opens on the garden is a most imposing piece of work. But I should never end if I tried to tell of all that, for one reason or another, is worth seeing in this marvellous town. In truth I felt that I should never get away if I tried to see it all myself. The most energetic traveller may be glad of the fact that there are no collections in Prague, either private or public, which need lie heavily on his conscience if he omits to visit them.

I will only add that much recent building has been done in Prague, and that some of it is both ambitious and successful. It does not intrude into the oldest parts of the town, fortunately for itself and for them. A few conspicuous structures — the Museum, the Bohemian Theatre, etc., — stand along the fine new quays. But new streets of dwelling-houses stretch back of the Neu Stadt in a quarter of their own. Its generous planning—its wide streets and spacious squares and profusion of greenery—might teach a lesson to the parsimonious American mind. Italianizing are much more common than German Renaissance forms, and I may note that the color effect of the new streets is unusually good. Fine building stone is plentiful in warm yellow tones, and even where stucco is used there is more variety and more warmth of tone than we find, for instance, in Berlin or Dresden.

I must not close my rambling chapters without giving a word to the beautiful iron-work that meets us at every step and has come down from many different periods. The finest and most unusual specimen I saw was a screen which entirely filled a huge pointed window in the second or bell stage of the cathedral tower. Its elaborate tracery, somewhat close and formal in the body of the window but lighter and more flowing in the head, seemed to me a sensible as well as a beautiful expedient, one which might perhaps be resorted to to-day, when bells proscribe the use of glass. But I doubt whether to-day would consent to let its iron rust so that it would stand out like this screen at Prague, a ruddy lace-work of lovely lines against the dark of the tower's interior. M. G. van Rensselaer.

HISTORY OF TRADE GUILDS. — I.[1]



GUILDS have always had a certain democratic character. They owe their origin to the endeavors of the toiling masses to free themselves from the galling yokes of oppression, and to secure to themselves and to their posterity the privileges of citizenship, equality before the law, rights of labor, and other inalienable rights. To secure these ends, organization was necessary, for individuals, acting single-handed, were powerless to achieve anything against a tyrannical aristocracy, sustained by wealth, royalty, and the sword.

From time immemorial, gold, property and rank, as they have been possessed by the aristocratic minority, have had far more value and influence than the toil of the great majority, who held the secrets of the workshop, and brought to light the treasures of the mines, and it is only of late that the laborer and the artisan have found it possible to stand up like men and make themselves felt in the social and political history of the nations.

In the days of so-called Spartan, Athenian and Roman liberty there was but very little freedom in fact, except among the privileged few, whom the accident of birth had placed in a happier position than that enjoyed by their fellow men. Thus, during the dawn of authentic history we find no traces of guilds, because all the freedom there was and all the power that really existed were lodged with the aristocracy, who guarded what they supposed was their own well-being, by the enslavement of the toilers, and it was not until these nations had developed an intellectual civilization of such grand magnitude that its benign rays penetrated the ranks of the laboring millions, and aroused in them an inextinguishable desire to secure certain privileges and rights which belonged to them as members of the family of man. When this period was reached history begins to tell us of certain organizations and unions among the artisans, which had many characteristics resembling the guild organizations of more recent times. But before the Christian era history is very meagre in its details concerning the various trades and the peculiar features of the organizations which may have controlled them.

We know that in Egypt, at the time of the Ptolemies, the people were divided into priests, warriors, agricultural laborers and workmen; and that in most of the employments the son was compelled by law to follow the trade or business of his father.

Theseus, the Athenian, decided that the skilled workmen should form a separate class of citizens, and during his time history mentions many trades, while upon those relating to war were conferred special rights and privileges.

The fact that Grecian history mentions the existence of numerous trades, and that their members had special festivals, partially helps to establish the belief that guilds were in vogue in those days. The merchants celebrated the festival of Hermes; the metal-workers, the *Chalkeion*, or copper festival. This latter Etimologos pronounces as the most esteemed and the oldest of all the trades. We find also certain expressions in history which, in a measure, sustain the belief that guilds existed during Athenian greatness.

The word *eregasia* means in reality trade, guild or union, or a confederacy of hand-workers; *erekotomos* referred to the independent workmen engaged in building; *tecton* had the same meaning as the German word *gesellon* (fellows) and *architecton* is the origin of our word "architect," and has the same meaning as the German word *baüfuhes*, which signifies master-builder.

These expressions, with the well-known tendency of the Greeks to form coteries and secret societies, combined with the fact that the son usually inherited his father's trade, and further, that such expressions as "art-work," "trick," "artificer," "artisan," meant at the same time, secrecy and cunning, help to confirm not only the belief that guilds existed in Greece, but lead to the supposition that the right of the guilds to exist was recognized by the state. However, history

[1] A consular report made to the Secretary of State, by James T. Du Bois, Consul at Leipsic, on Guild Organization in Ancient Times: Origin and Progress of Trades Unions: Power and Influence of the Organizations in the Middle Ages, and Condition of the German Guilds at present.

throws so little light upon the condition of the guilds in Greece that a closer examination of the subject would afford but meagre satisfaction. With Rome it is different. Even her mythical period is marked by traces of the guild.

Of Numa Pompilius, who first secured a real governmental organization, it is said that he divided the plebeians into *collegia*. The principal of these, the *collegium pontificum*, received its name from the fact that all members of it were capable of constructing bridges, which was an important knowledge in those days, as bridges were necessary in warfare. The members of the *collegium pontificum* were called *pontifices* (bridge builders), and owing to their importance they exercised considerable influence, and finally numbers of them assumed the position of priests; hence the present word "pontiff."

During the conquests of Tullius Hostilius the *collegia opificum*, a sort of workmen's organization, were abolished. Servius Tullius re-established them, and the aristocratic Tarquinius Superbus suppressed them, because, being composed of plebeians and well organized, they threatened the power of the patricians.

The *collegia opificum* were the protecting bulwark of the various trades. They kept a vigilant watch over their rights and privileges, and afforded protection to the members at all times. This protection, however, during the republic became very difficult, owing to the fact that the slaves who worked under patrician protection, and the Greek artisans, who invaded the country in great numbers, caused a great competition. The *collegia opificum* spread rapidly over the most civilized of the Roman provinces, and the cause of this remarkable growth can be traced to the rigorous adoption of the maxim of the Romans, that of securing conquered provinces by establishing Roman customs as quickly as possible. This was done by sending a large number of artisans with the army of invasion. In due time the membership of the *collegia opificum* became enormous, and with this increase of strength there came a most natural desire to engage in the political affairs of the nation, and especially the social polities of the country. This tendency greatly offended the aristocratic element, and in 67 B. C., they succeeded in obtaining a senatorial decree which abolished most of the guilds (*collegia*), only those being allowed to remain which were absolutely necessary to the state. Among these were the carpenters' guild (*lignarii*) and the guilds of the iron, copper and gold smiths.

When five years later the plebeian Publius Pulcher Clodius assumed the power of state he re-established and augmented the guilds; but Julius Cæsar abolished the most of them again, and Augustus Cæsar confirmed his action. Then came Trajan, who desired to destroy them, but the guilds being powerful, he hesitated to execute his wish; and when Constantine the Great was at the height of his power there existed over thirty guilds in Rome, and both Theodosius and Justinian confirmed and even multiplied their privileges.

Theodoric the Great found some guilds in Constantinople when he conquered that place, and they seemed to please the old warrior who was not in sympathy with the aristocracy. The *singularium actium magistri* (masters of special arts) are mentioned often during the reign of the Ostrogoths. The title of *magister* was given to every full privileged member of a guild during those days. These things, combined with the high position held by architects under Theodoric, prove that he favored and protected these organizations.

In 590, the Queen of Lombardy, Thudelinde, gave certain privileges and rights to the *magistri Comacinis* (stone-cutters; Ostrogothic, *steinmetzen*) on the island of Comacina, in the Lake of Como. This *magisterium* (mastership, from which comes the French word *métier*) *Longobardorum* existed until the Fall of Didier, and from 644 to 724 it was regulated by special laws. Besides the *magistri Comacinii*, we have proofs of the existence of the *magistri Cucarii* (house-builders) and the *magistri Antelamii* (carpenters of Antelamo). When Charlemagne sent his young wife, Déserèe, back to her royal father, Didier, the Lombard king, bearing a message to the effect that Longobardian maidens would make passable wives for sleepy monks, but not for the stalwart men of the Carlovingian race, he followed the insult up by invading the country, and wresting from his repudiated father-in-law the famous iron crown. To atone for this injustice in a measure, and soften the wrath of the people, he confirmed the privileges of Longobardian guilds, and gave to the *mauern* (*maçons*) the right enjoyed by the free Franks, hence the words "freemasons." Long before this time many Longobardian artisans had emigrated to France and Holland, and had carried the guild system with them, so that under the comparative liberal government of Charlemagne they flourished better than for centuries.

The clericals and monks began now to engage in the various trades, and soon were able to exercise considerable influence over the different branches. In 738 the *pes publicus* (the royal standard foot-measure) of Liutpand, did not satisfy the monks, so they established their own measure, which was called *pes de munichis* (monachal standard foot); and from 914 to 916 the Benedictines strove in vain to prohibit the masons of Lombardy from constructing convents and other religious institutions. At this point began an obstinate struggle of the guilds against the clerical workmen, and also against the serfs and bondmen employed by the aristocracy and nobility. The struggle was bitter, and was felt throughout the continent. The effort of the clericals to prevent the guilds from obtaining employment on religious structures did not succeed. In 924 Bishop Ulrich, of Liege, Belgium, could not find enough architects among the clericals, and was therefore compelled to employ members of the guilds. In 1090, Manegold, the architect was compelled to join a monastic order, before he could secure the contract for building the convent at Marbeck. In 1099 Bishop Conrad, of Utrecht, prevailed upon the son of the architect, Pleber, to betray the secrets of the *concilium latomorum*, a guild. A short time afterwards the son was put to death by the father for his treason.

In 1099 a guild of weavers is mentioned as existing and having existed a long time in Mayence.

In 1104 the butchers of Augsburg established a guild.

The fishermen's guild in Worms was confirmed in 1106, a fact which proves that such a guild existed in that place before the date mentioned. In 1114 the weavers' guild of Worms was confirmed. In 1134 a butchers' guild was established for the first time in Paris; and in 1149 the bed-cover weavers' guild was established at Cologne.

The shoemakers' guild of Magdeburg is mentioned for the first time in 1157, and from the records it appears that they succeeded in securing a law by which only those belonging to the guild could place their wares on the market for exhibition or sale. Here also is found the earliest mention of the word "guild." "Gilde," from whence comes "guild," which signified originally a banquet or drinking match (*zecke*), at which money (*geld*) was contributed to the guild. This money (*geld*) was called *gaffel*, *gabe*. From this time on the words *innunge*, *eijninghe*, *gilde*, *gaffel*, *zeche* frequently appear in the records concerning this organization.

The word "*zunft*" (*conventus*, corporation) so often used for the word "*innung*" or "guild," was first used in 1260.

In 1162 there existed six guilds in Halle, composed of shopkeepers, shoemakers, bakers, butchers, smiths, and doublet-weavers.

In 1180 there were fifteen guilds in London.

Mr. Baurath Mothes, one of the most eminent Saxon architects of this day, and the author of several works on the condition of the laboring classes, on architecture, and the guilds, says that soon after 1180, the guilds became powerful supporters of civil liberty, and thereby won the hatred of the aristocracy to such an extent that from 1200 to 1219 they were suppressed by the Emperor Frederick II at Gaslor; but in spite of the cruel and vigorous efforts of the aristocracy and of royalty to crush out these organizations, they continued to exist, and in 1232 the imperial restrictions were removed. During the struggle against the imperial prohibition, however, the masters and even members of the guilds were subject to outrageous and inhuman treatment. At Brunswick, in 1220, twelve masters of the guild were martyrs to their cause; one-half of them were cruelly put to death, and the other half were banished.

In 1230 the guilds of Magdeburg, which had existed for some time and had grown powerful, were broken up by royal order; but the towns, which in those days were the strongholds of civil liberty against the aristocratic knighthood, soon secured a re-establishment of the guilds, and they were not only tolerated, but were granted greater privileges and rights than were enjoyed before their dissolution. A similar case occurred in 1231 in Wurzburg, where, notwithstanding the opposition of the Emperor and the bishops, the guilds secured toleration, and in 1279 were confirmed.

In 1254, for the first time in history, two masters of the guilds, a furrier named Henry, and a rope-maker named Arnold, were selected as members of the town council of Leipsic.

In 1272 Rudolph Hapsburg issued a decree recognizing the right of the guilds to exist, and he extended to them at the same time the privilege of bearing arms.

In 1272 was organized the first bakers' guild in Berlin; then, in 1280, came the furriers' guild; in 1284 the shoemakers' guild, and in 1285 the tailors' guild. Leipsic, however, boasted of a tailors' guild one year earlier, and in 1295 we find the first record of the woolen-weavers' guild in Berlin.

During the thirteenth and fourteenth centuries Magdeburg was the scene of the fiercest struggles of the various guilds, and it was at the same time the place of some of their most fruitful victories. In 1330 they secured several seats in the town council, and seemed to exercise considerable influence in municipal affairs, but the very next year the aristocracy, jealous of their power, robbed them of their recently secured privileges, and without excuse, and with black malice, put all of the masters to the flame, and this made one of the many terrible pages of history concerning this historic old town. But while the guilds were thus cruelly annihilated and their leaders cremated alive, the determined spirit of the artisan masses still lived, and after a number of years of cruel treatment and hardships they again secured their rights in spite of the persistent opposition of the aristocracy, and were once again to be found sitting among the city fathers, and exercising their influence to secure certain natural and inalienable rights which belonged to those who toiled in the workshop, and labored in the mine, while the prince and the aristocrat taxed them and tolled out their gains to gratify luxurious and idle tastes, and this influence was not confined alone to Magdeburg, but was felt in other districts, and helped to secure many advantages to the guilds of Brunswick and neighboring provinces.

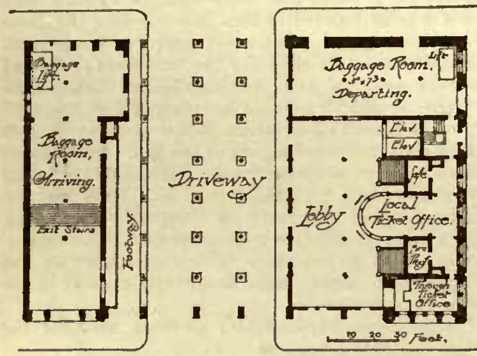
Zurich admitted several masters of the guilds to her town council in 1335, but not until the place had passed through a terrible and bloody conflict. This struggle lasted from 1330 to 1390, and was commonly considered as a war between the aristocracy and artisans.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

PASSENGER STATION, PENNSYLVANIA R. R., PHILADELPHIA. MESSRS. WILSON BROS. & CO., ARCHITECTS, PHILADELPHIA, PA.

[Gelatine Print, issued only with the Gelatine Edition.]



THE Broad Street Passenger Station, the Philadelphia terminus of the numerous lines of the Pennsylvania Railroad, was opened to the public in January, 1882. The arrangement is peculiar, owing to the fact that the railroad tracks, after crossing the Schuylkill River, are carried on a brick arcade along the south side of Filbert Street, at a considerable elevation above the street, and enter the station at the level of the second floor. The first story thus becomes a kind of basement above ground, and is so treated architecturally.

The front on Broad Street measures 193 feet 5 inches, and the depth on Filbert Street is 122 feet 10 inches. On the right about 80 feet of the frontage is occupied by ticket-offices, baggage-room (departing), 30′ x 73′, and a lobby, 40′ x 80′, for passengers in connection therewith, which lobby contains stairs and elevators to the waiting-rooms on second floor. On the left about 34 feet is occupied by the exit staircase, behind which is the baggage-room (30′ x 80′) for arriving baggage. The central portion, about 80 feet, is left open from front to rear, providing a convenient passageway for carriages, to which passengers have access from either street under cover.

In the second story the entire frontage on Broad Street is occupied by the ladies' waiting-room (29′ x 80′), with private room (13′ x 28′) and toilet attached, and the dining-room (29′ x 74′). The restaurant (40′ x 50′) opens from the dining-room, and is served by private stair and dumb-waiters from kitchen above. The general waiting-room (50′ x 80′) adjoins the ladies' waiting-room and the restaurant. It is approached by the entrance stair and elevators from first floor, and opens on the train lobby (30′ x 190′) extending the whole length of the building on rear (Fifteenth Street), and communicating with trains by gates. The exit stair descends directly from this lobby, and a baggage-lift is provided at each end, connecting with the baggage-rooms for arriving and departing baggage. The offices in the upper stories are approached from this lobby by a private stair and passage on the Filbert-street front, which also affords access to the toilet-rooms for gentlemen.

The train-house, which begins at the gates from the lobby, extends about 450 feet in length to Sixteenth Street, being carried across Fifteenth Street on girders. It contains eight passenger tracks and platforms.

The style of the building is a modern adaptation of Gothic architecture. The eastern or principal front is divided into six unequal bays by piers and buttresses, flanked on the north by a clock-tower, and on the south by a gable, in which are the openings to the exit-hall and stairs. The tower and two bays next to it include the ticket-offices, lobby, entrance-stairs, etc., the other bays being open through on the street level, so that carriages may drive under.

The basement or first story is of granite, above which are three stories of red brick and terra-cotta. The second floor, as before mentioned, is at the level of the tracks, where all the principal apartments are located. The second story is therefore the principal one, and is so treated architecturally, the height of the large rooms being divided at either end by entresols.

The piers are carried up, from their granite bases, in terra-cotta as far as the springing of the large windows of the second story, the jambs of which are decorated with slender terra-cotta columns, two to each side, with enriched shafts and caps, from which rise the great arches of elaborate terra-cotta work in three orders.

The transom lights are kept rectangular, forming spandrels under the arches, which are of terra-cotta, richly decorated. Over the piers between these arches are circular panels, containing finely modelled heads typical of the races of humanity, indicating the cosmopolitan character of the institution and its widespread benefits. The upper stories, being occupied by offices of the company, are more plainly treated, and the openings are made smaller and more numerous, to suit the necessary subdivisions. At the level of the fourth floor a balcony is got in the thickness of the wall, the face above being set back and the line of the wall face below carried up by buttresses, through which openings are pierced, making the balcony continuous. Two of the bays of this front are carried up through the cornice, and form gables, which contain windows lighting an attic story extending over the whole building, and serve to break the otherwise long lines of the cornice. The front on Filbert Street is treated in a similar manner, extending from the clock-tower to the bridge crossing Fifteenth Street, and connecting with the train-house.

The granite-work is executed with extreme simplicity, the blocks being large, and the natural unworked surfaces being used wherever practicable. The mouldings and enrichments there used are bold and simple in character. The terra-cotta work, on the other hand, is very elaborate. The individual pieces are small, and plain surfaces are avoided as much as possible, to obviate the difficulties met with in manufacturing large pieces, and the bad effects of warping and shrinking. The red brickwork is relieved by bands of moulded brick of the same color at intervals, which serve to break the plain surfaces without destroying the solid effect.

The interior is carried out in the same style as the exterior. In the lower story the walls of the lobby and stair-halls are faced with enamelled brick in buff and white, with dado of chocolate and black, and frieze of white and blue in patterns. Caps and corbels, arches, skirtings, etc., are of blue marble. The ceiling is arched in brick between rolled-iron beams, supported on heavy wrought-iron girders, which in turn are upheld by powerful cast-iron columns, consisting of a square central section surrounded by a cluster of four shafts with caps and bases, from which spring ornamental cast-iron brackets, in the shape of a quarter-circle, connecting with the under sides of the girders. The iron-work is all exposed to view and decorated in colors. The floor of the driveway is laid with a pavement of asphalt, and the rest of this floor is artificial stone. The wood finish of this story is ash. The stairs to the waiting-rooms above are marble, with a handsome wrought-iron railing.

In the second or principal story the jambs and arches of the openings are marble, and the floors marble tile, except in the lobbies, etc., where artificial stone is used in colored patterns with good effect. In the lobbies and other exposed portions the walls are colored and enamelled bricks; elsewhere panelled wooden dadoes are used.

The ceilings of the ladies' waiting-room, dining-room, exit stair-hall, and lobby to train-house are hard-wood, divided into panels by the girders supporting the floors above, and subordinate moulded ribs running between them.

In the ladies' waiting-room, dining-room, and exit stair-hall the ceiling is supported by curved trusses springing from the walls at the same level as the springing of large windows, and resting on marble corbels built in the walls. These arched trusses are quite elaborate in design, and add much to the beauty of the apartments.

The waiting-rooms, dining-room, and ladies' private room have large open fireplaces, and the transoms of windows and doors and the ceiling over main waiting-room are glazed with cathedral glass in lead, plate-glass being used elsewhere.

The train-house is divided into two equal spans of eighty feet by a row of wrought-iron columns enclosed in ornamental open casings of cast-iron, which carry the roof-trusses. These trusses are wrought-iron, in the form of a double segment, meeting at the ridge in a low Gothic arch, with ornamental struts and tie-rods. The walls are red pressed brick, divided into panels by moulded pilasters and arches, the pilaster caps being red terra-cotta, and the spandrels filled with buff moulded bricks arranged in patterns. Along the base is a skirting of blue marble, and a moulded sill-course of the same stone extends the whole length below the windows, which have semicircular heads following the lines of arches between the pilasters.

COMPETITIVE DESIGNS FOR A MEMORIAL TO GENERAL GRANT.

THE jury invited to award the three equal prizes of fifty dollars each, offered by the publishers of the *American Architect* for the best designs for a "Memorial to General Grant, to be erected by a large city, at a cost of not more than $100,000," have examined the designs submitted, and have awarded the prizes to the designs submitted by Mr. Harvey Ellis ("*Fifth Corps*") of Utica, N. Y.; Mr. O. Von Nerta ("*Vita*") Washington, D. C., and Mr. C. S. Luce ("*Quid nunc*") New York, N. Y.

CHARLES A. CUMMINGS, Architect.
HENRY VAN BRUNT, Architect.
TRUMAN H. BARTLETT, Sculptor.

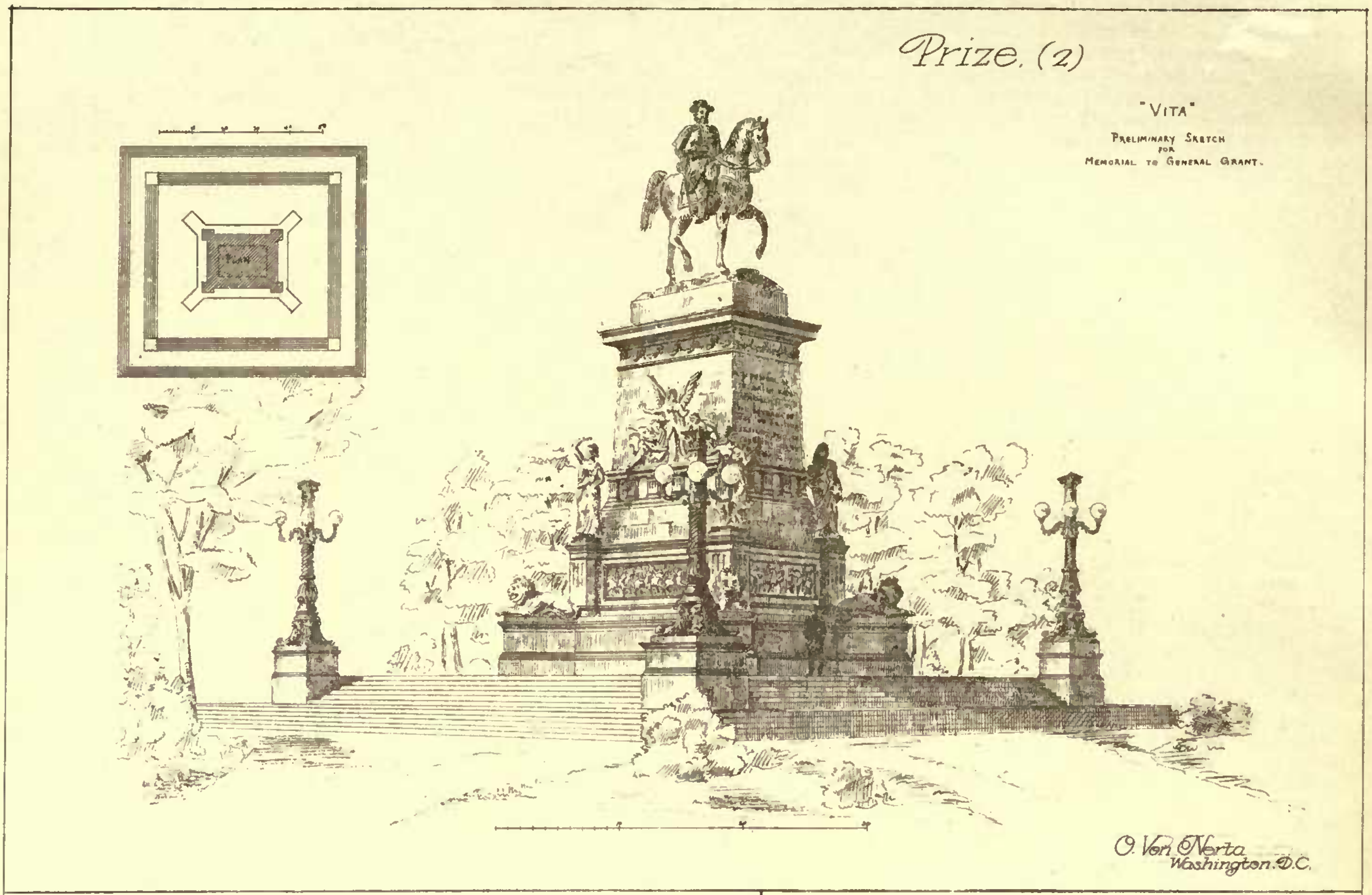
As the descriptions placed upon the drawings are in some cases illegible because of the great reduction they have undergone, we print them below: —

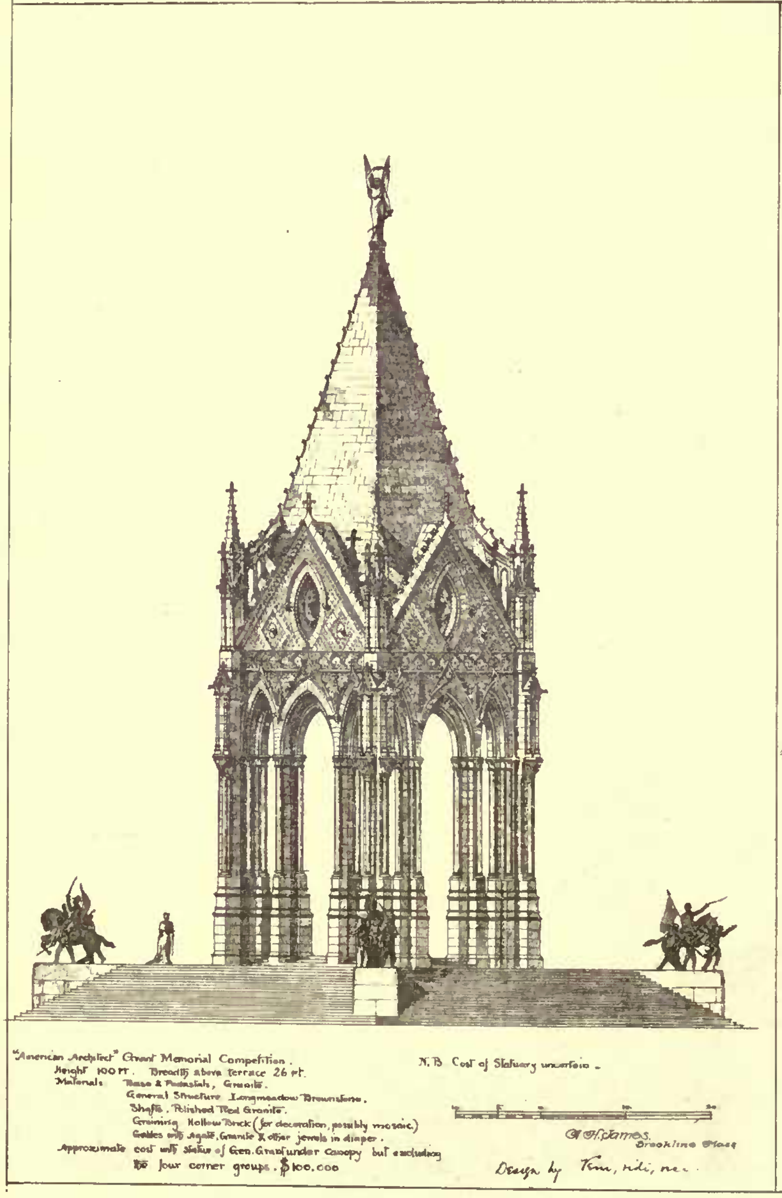
The design by "*Vita*" bears the following description: —

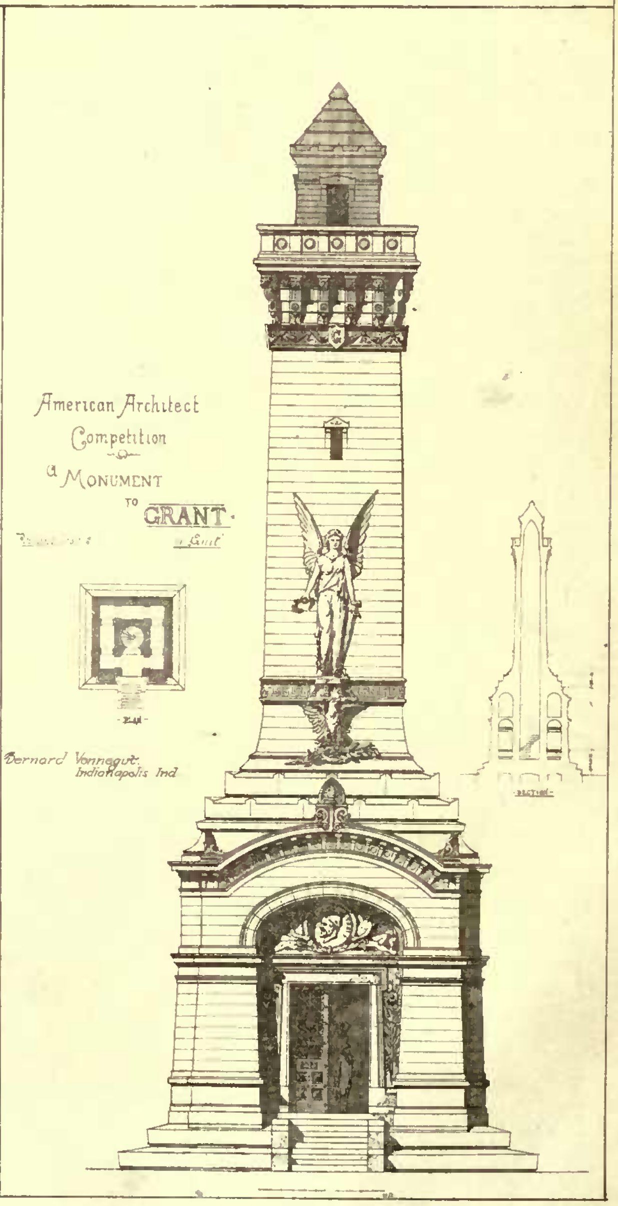
The fundamental idea of this monument is the "salvation of the Union" and "abolition of slavery" achieved by Grant as general and statesman. This idea is embodied by the two allegorical groups carved in low relief, only second in importance to the equestrian statue of the General. His character is represented by the allegorical figures, "Genius, Strength, Moderation, Justice." His steadfastness of purpose is further illustrated by the lions at the corners. Battle scenes and military processions, subordinate to the general idea, fill panels at the sides. The pedestal is of dark gray sandstone; base of granite; statues and panels of bronze. Total height, exclusive of base, forty-six feet. Estimated cost, $100,000.

The design by "*Deathless*" bears the following description: —

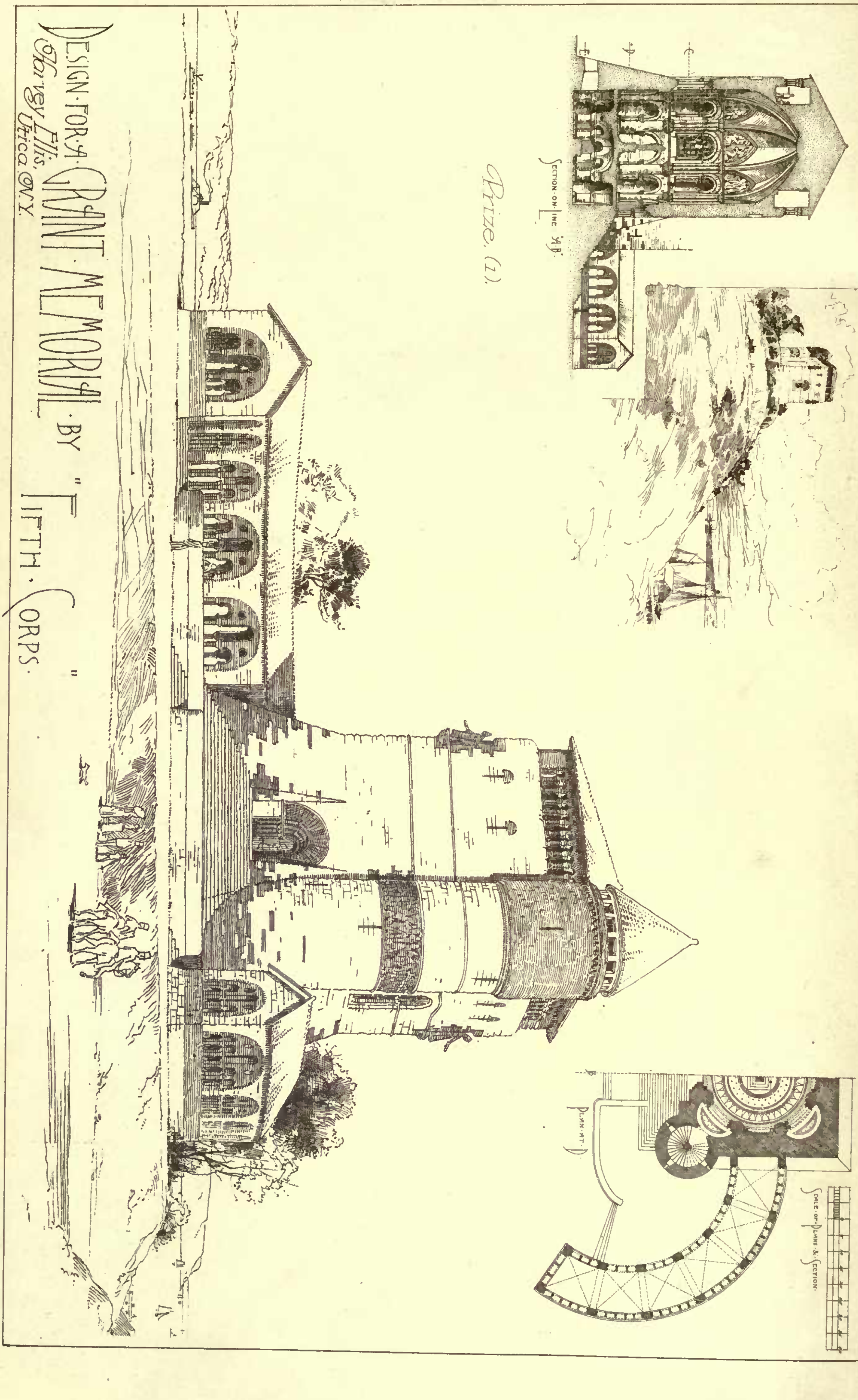
A mausoleum to the memory of U. S. Grant, erected by the aid of the different States of the American Union, on which will not appear the name of any battle of the late civil war, but serve as a memorial to his loyalty, patriotism, simplicity of manners, and perfect freedom from ambition. Material all of light granite, pyramids in granite



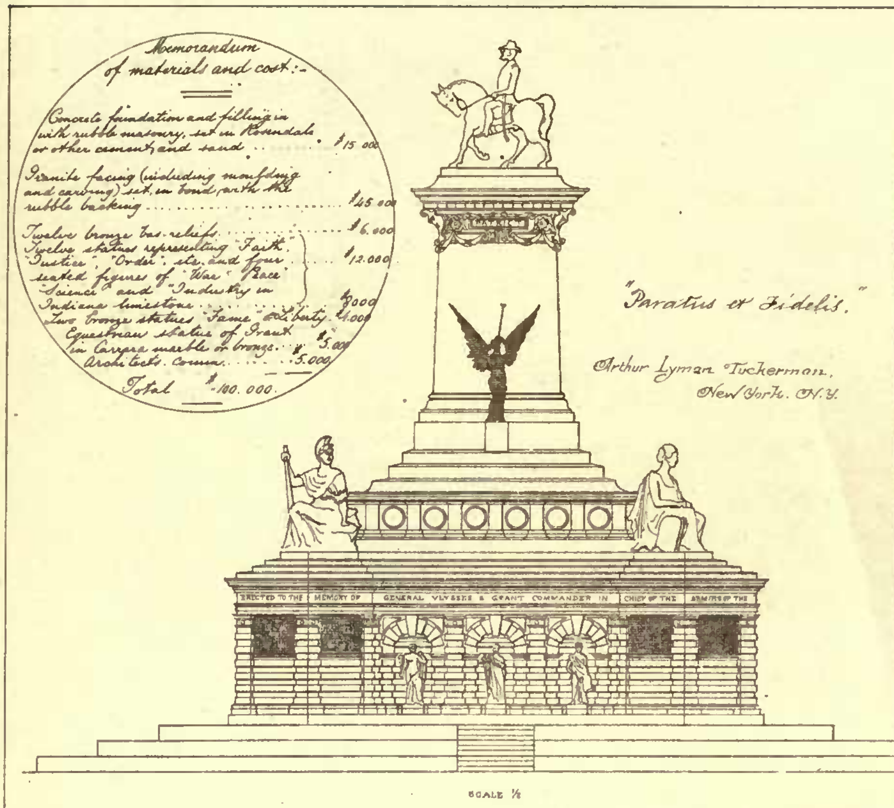


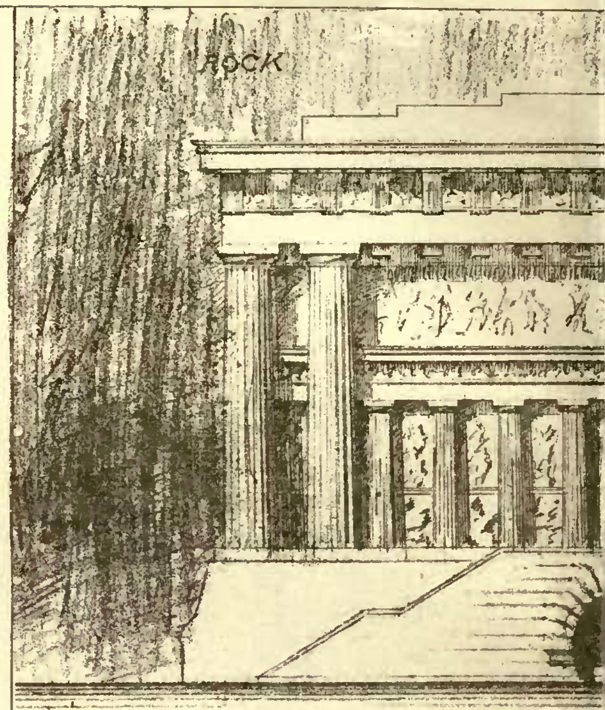


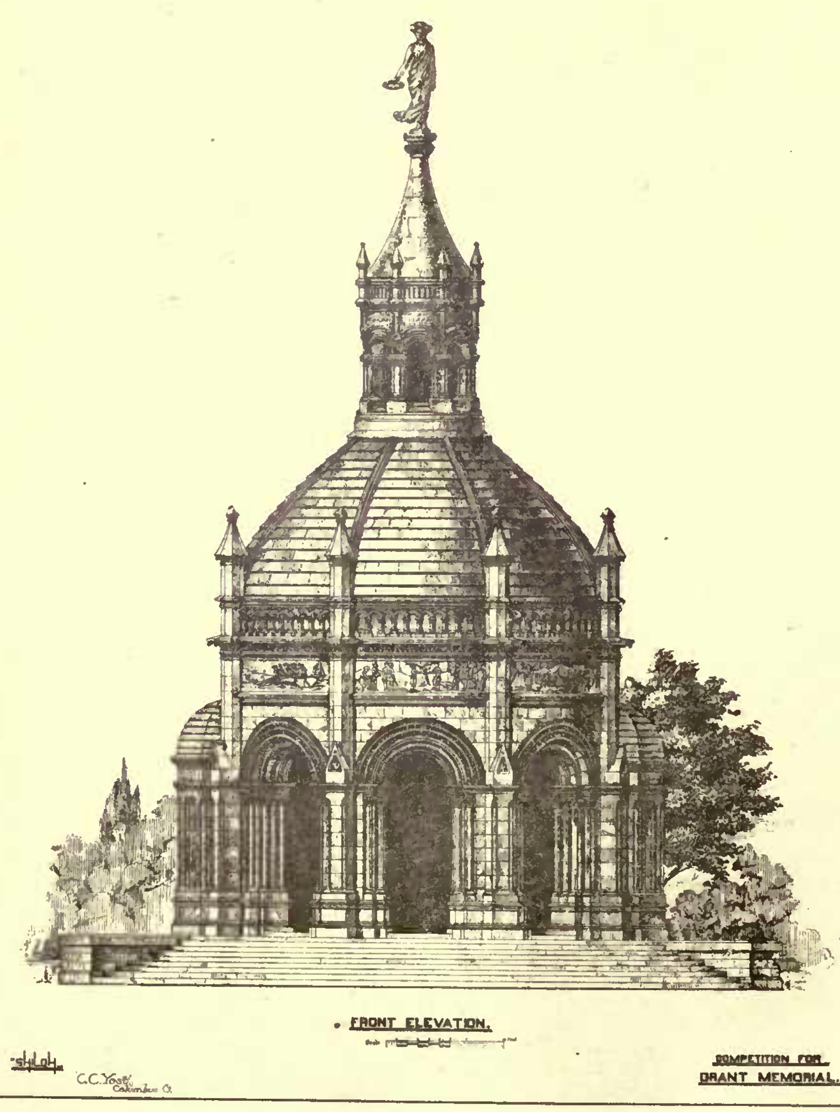
HELIOTYPE PRINTING CO. BOSTON

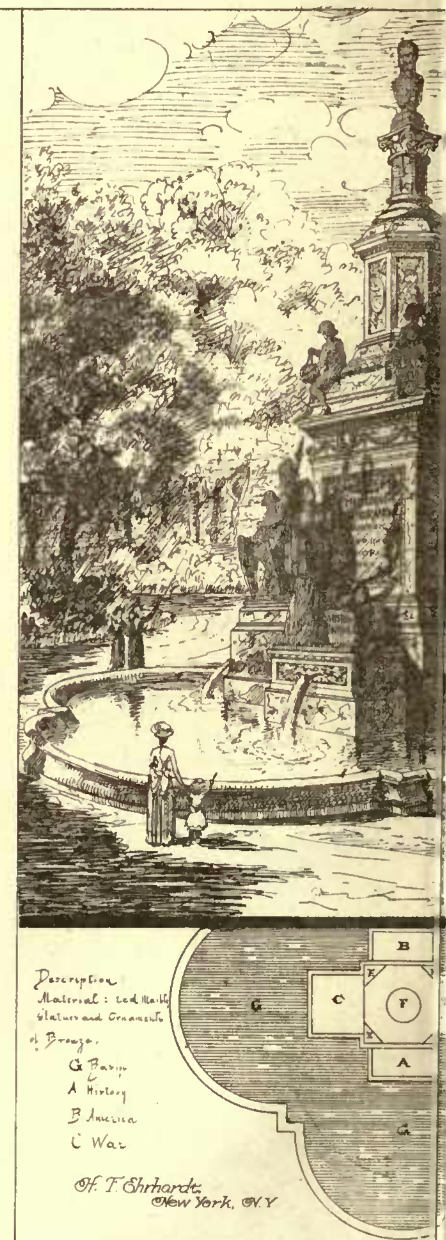


The Heliotype Printing Co. Boston.

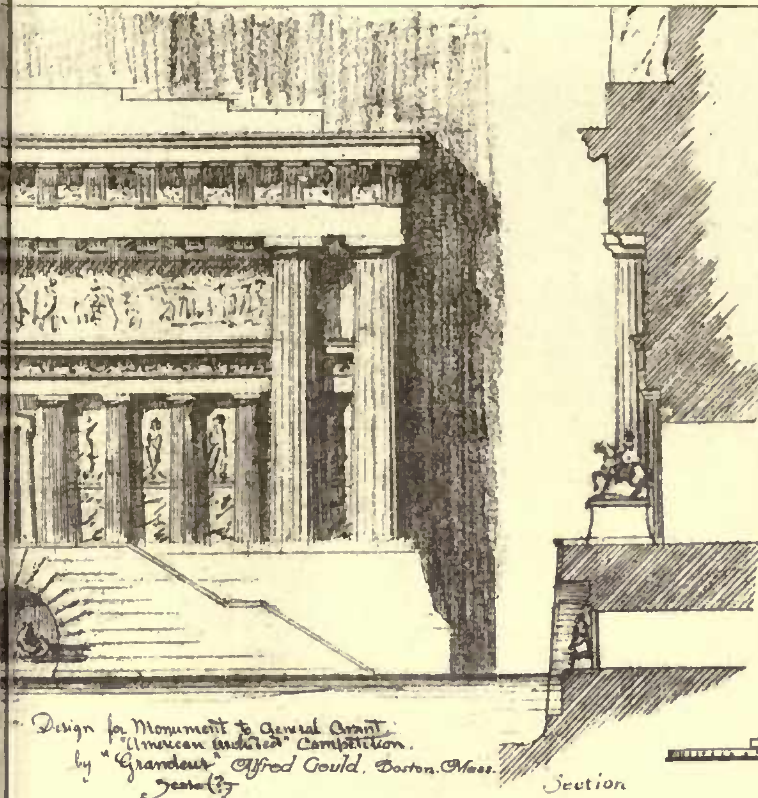

Memorandum
of materials and cost:-
Concrete foundation and filling in with rubble masonry, set in Rosendale or other cement, and sand ... $15.000
Granite facing (including moulding and carving) set in bond with the rubble backing ... $45.000
Twelve bronze bas-reliefs ... $6.000
Twelve statues representing "Faith" "Justice", "Order", etc. and four seated figures of "War" "Peace" "Science" and "Industry" in Indiana limestone ... $12.000
... $3000
Two bronze statues "Fame" & "Liberty" ... $4.000
Equestrian statue of Grant in Carrara marble or bronze ... $5.000
Architects. Comm. ... $5.000
Total $100.000
"Paratus et Fidelis."
Arthur Lyman Tuckerman,
New York. N.Y.
ERECTED TO THE MEMORY OF GENERAL ULYSSES S GRANT COMMANDER IN CHIEF OF THE ARMIES OF THE
SCALE 1/2

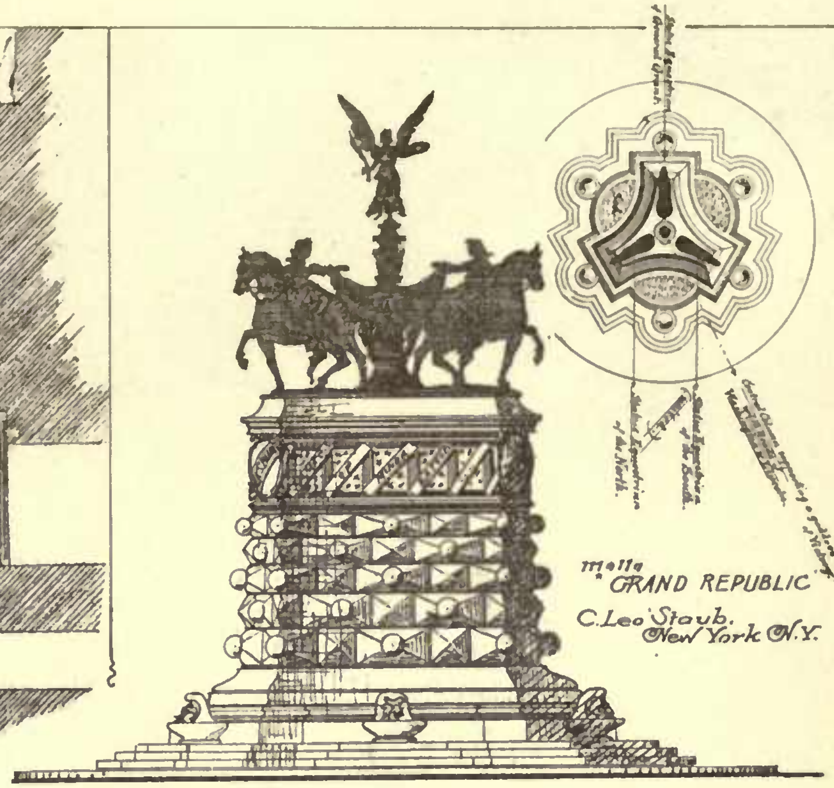

ROCK


FRONT ELEVATION.
"Shiloh."
C.C. Yost
Columbus O.
COMPETITION FOR
GRANT MEMORIAL.


Description
Material: red Marble
Statues and Ornaments
of Bronze.
G Basin
A History
B America
C War
A
B
C
F
G
H. T. Ehrhardt.
New York, N.Y.

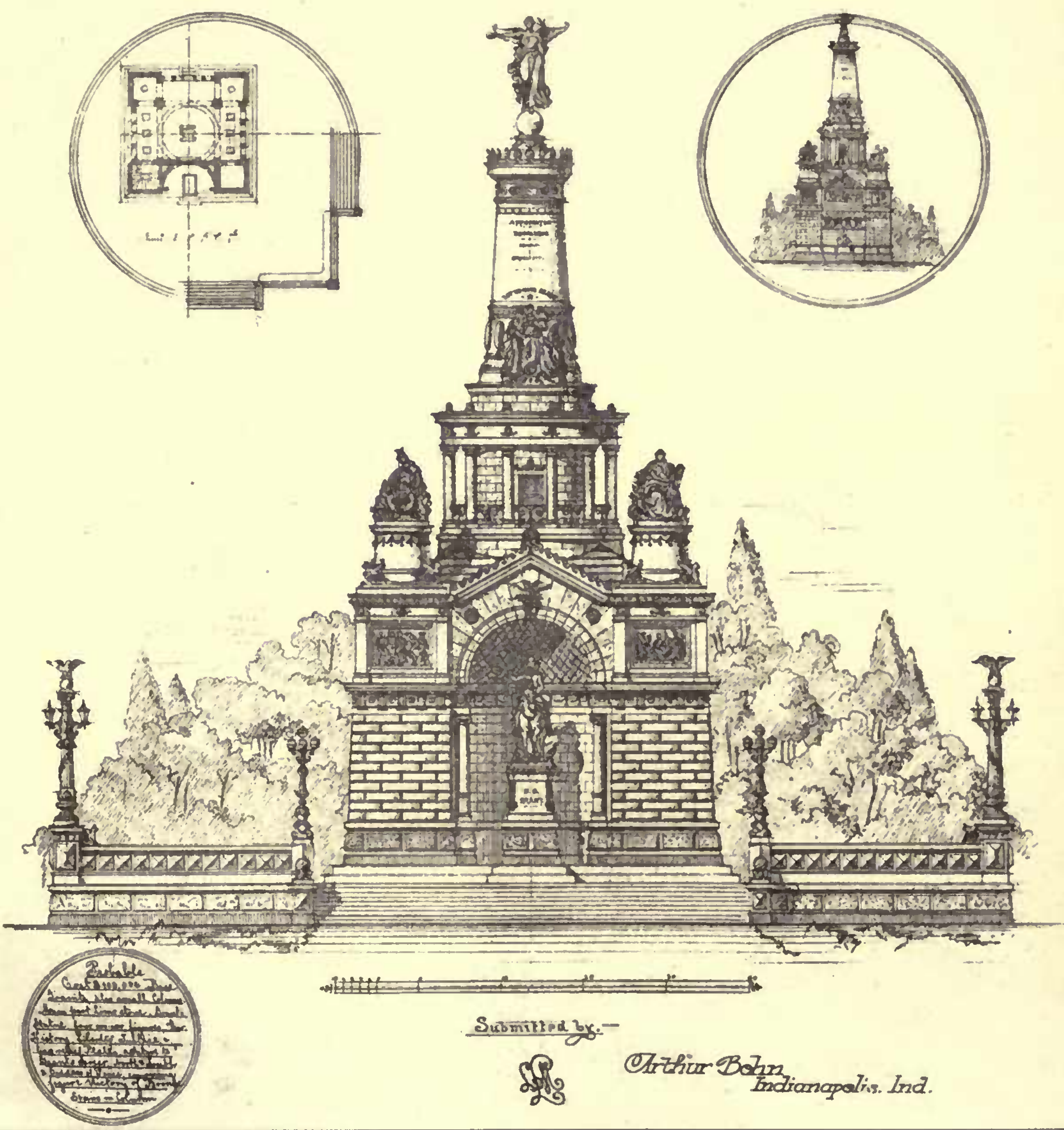
R. OSGOOD & Co





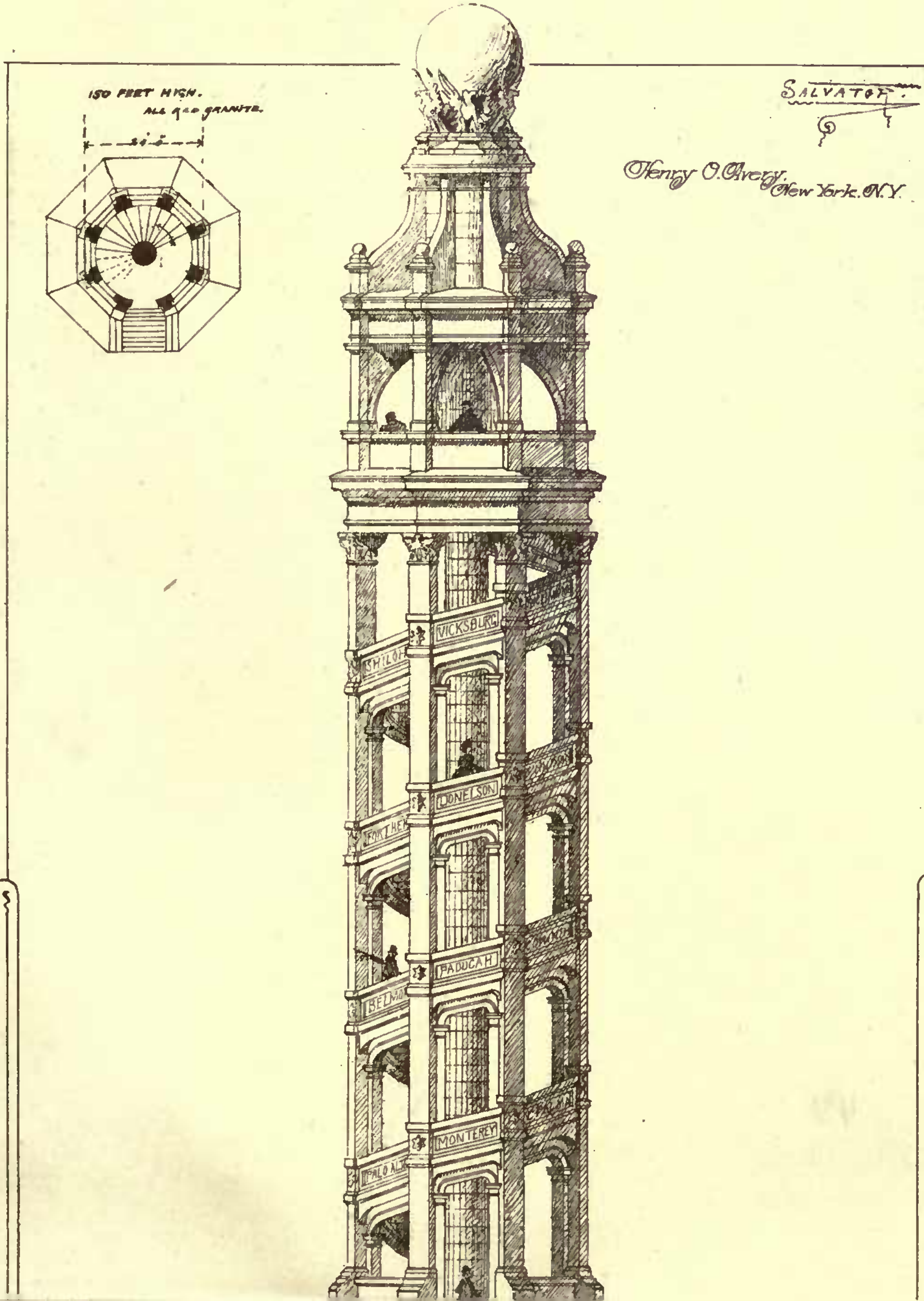


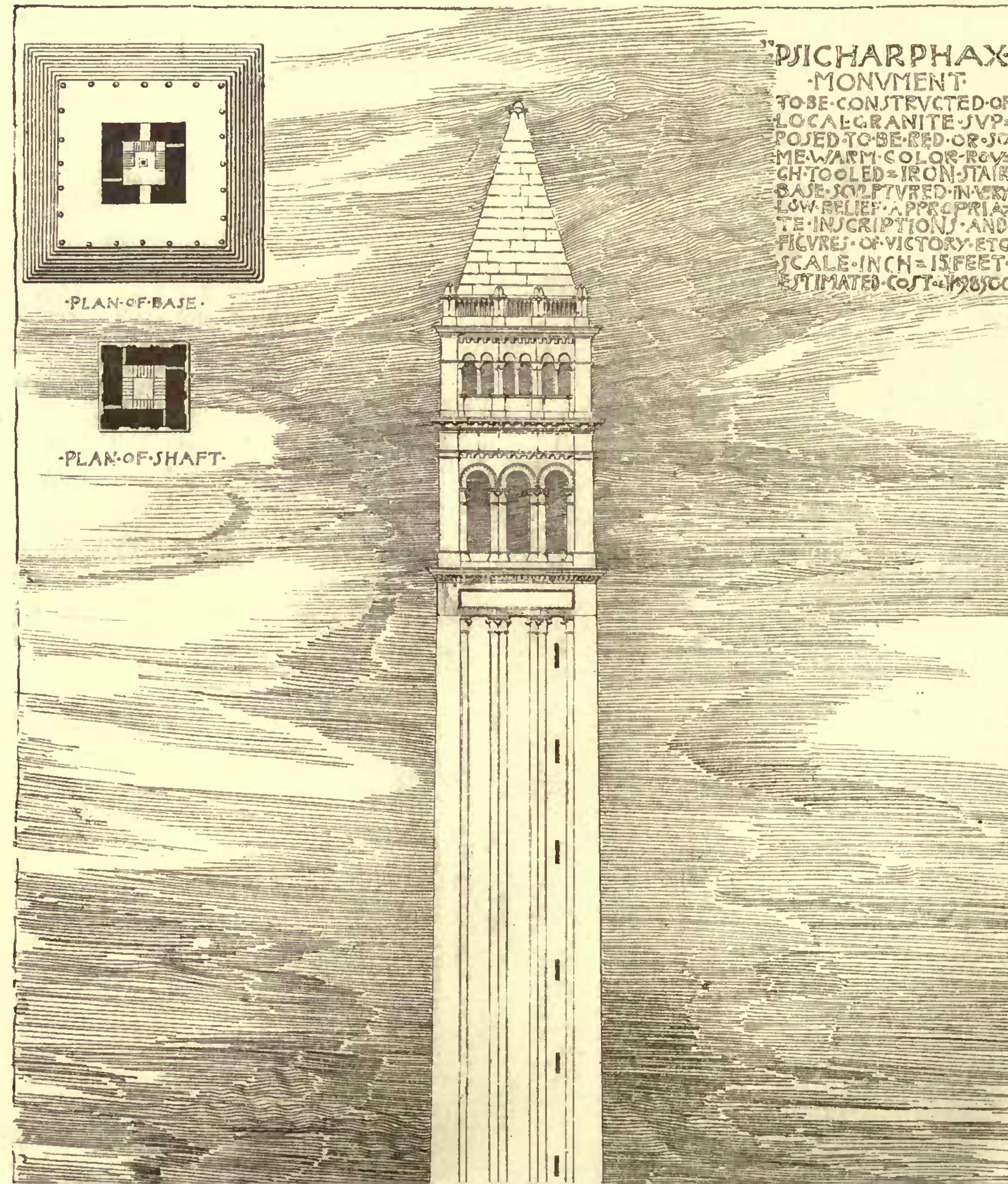


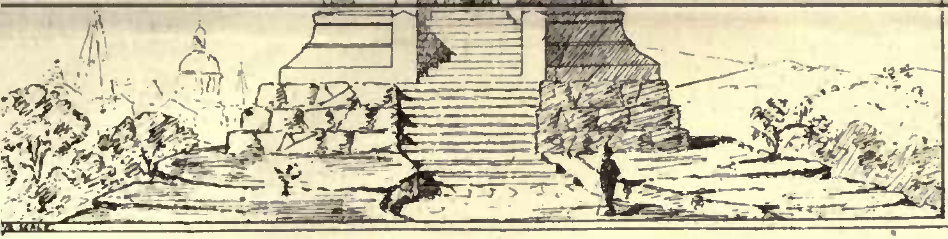


HELIOTYPE PRINTING CO BOSTON

AMERICAN ARCHITECT AND BUILDING NEWS SEPT. 26 1885

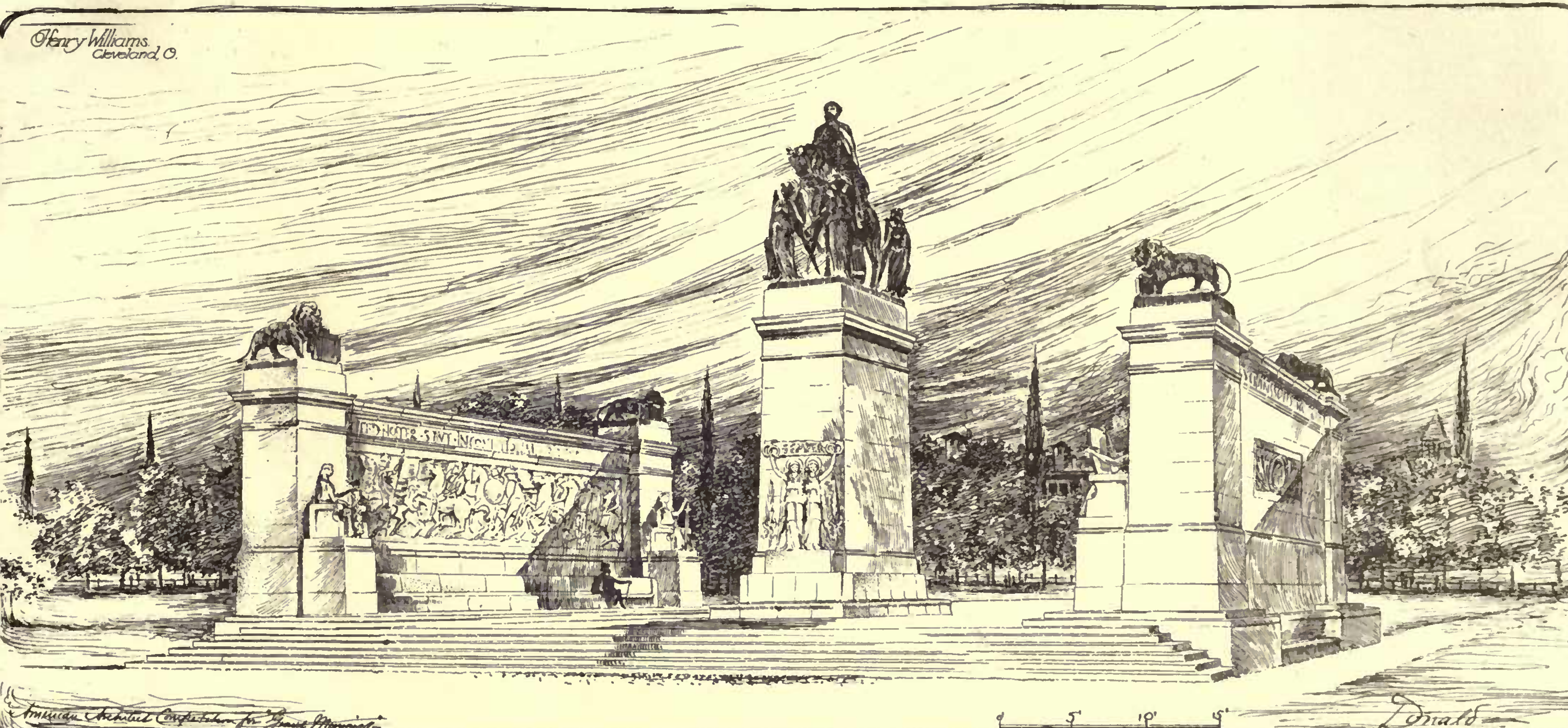








·ELEVATION·

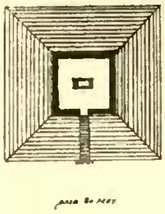


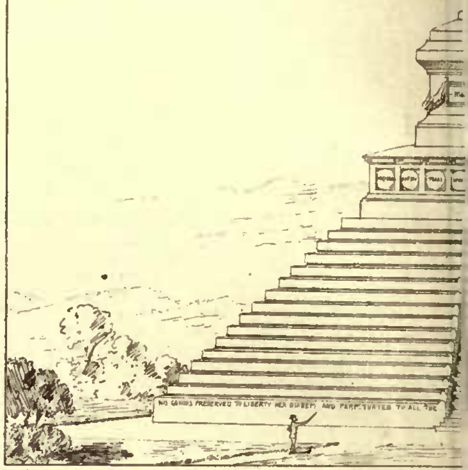
American Architect Competition for Grant Monument.

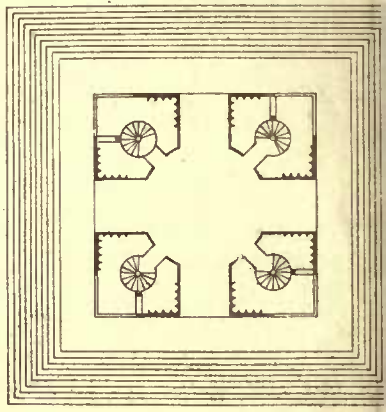
The Heliotype Printing Co Boston.

SKETCH FOR A MONUMENT TO GENERAL GRANT. BY "HERMIT."





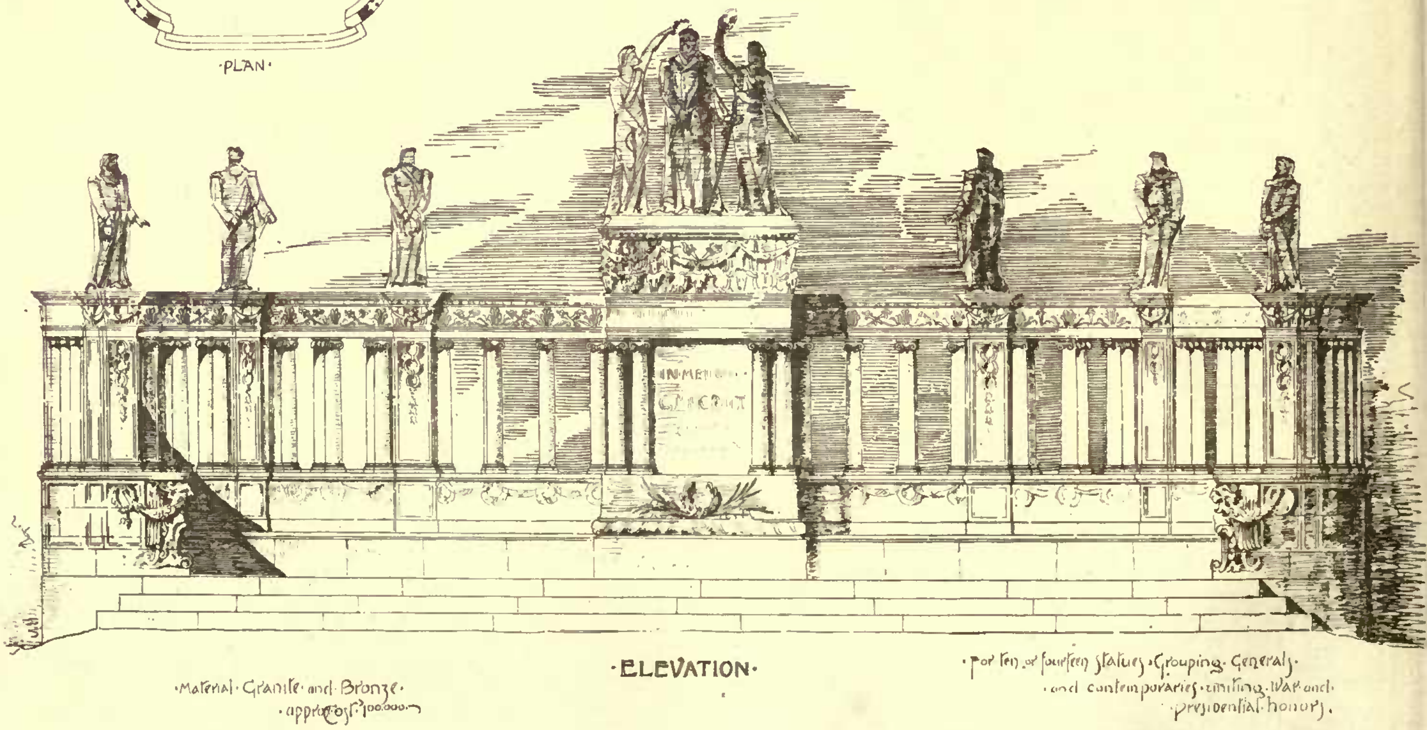




Uno Animo



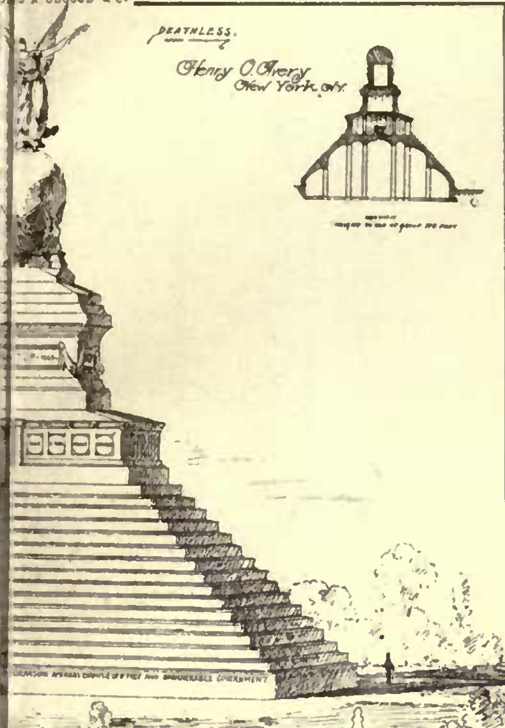
·PLAN·

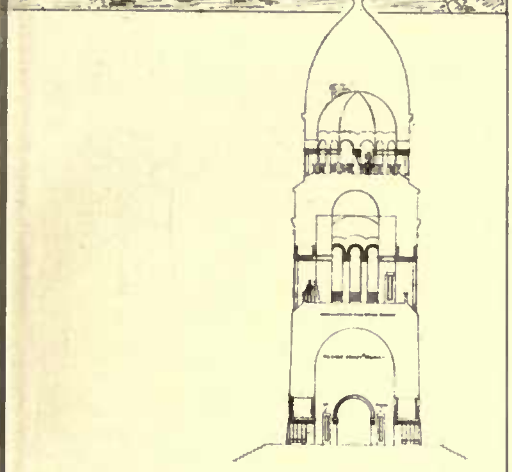


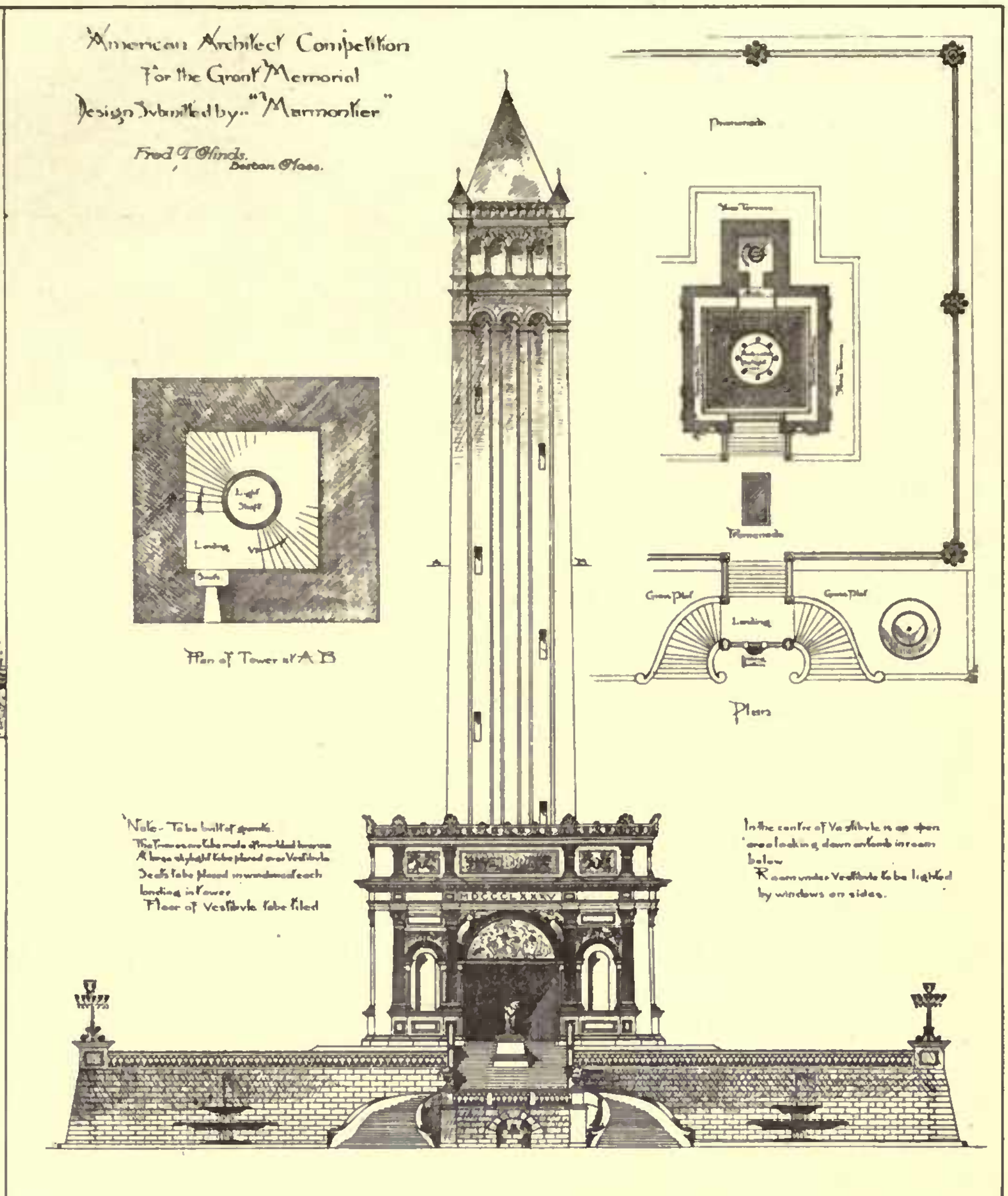
·ELEVATION·

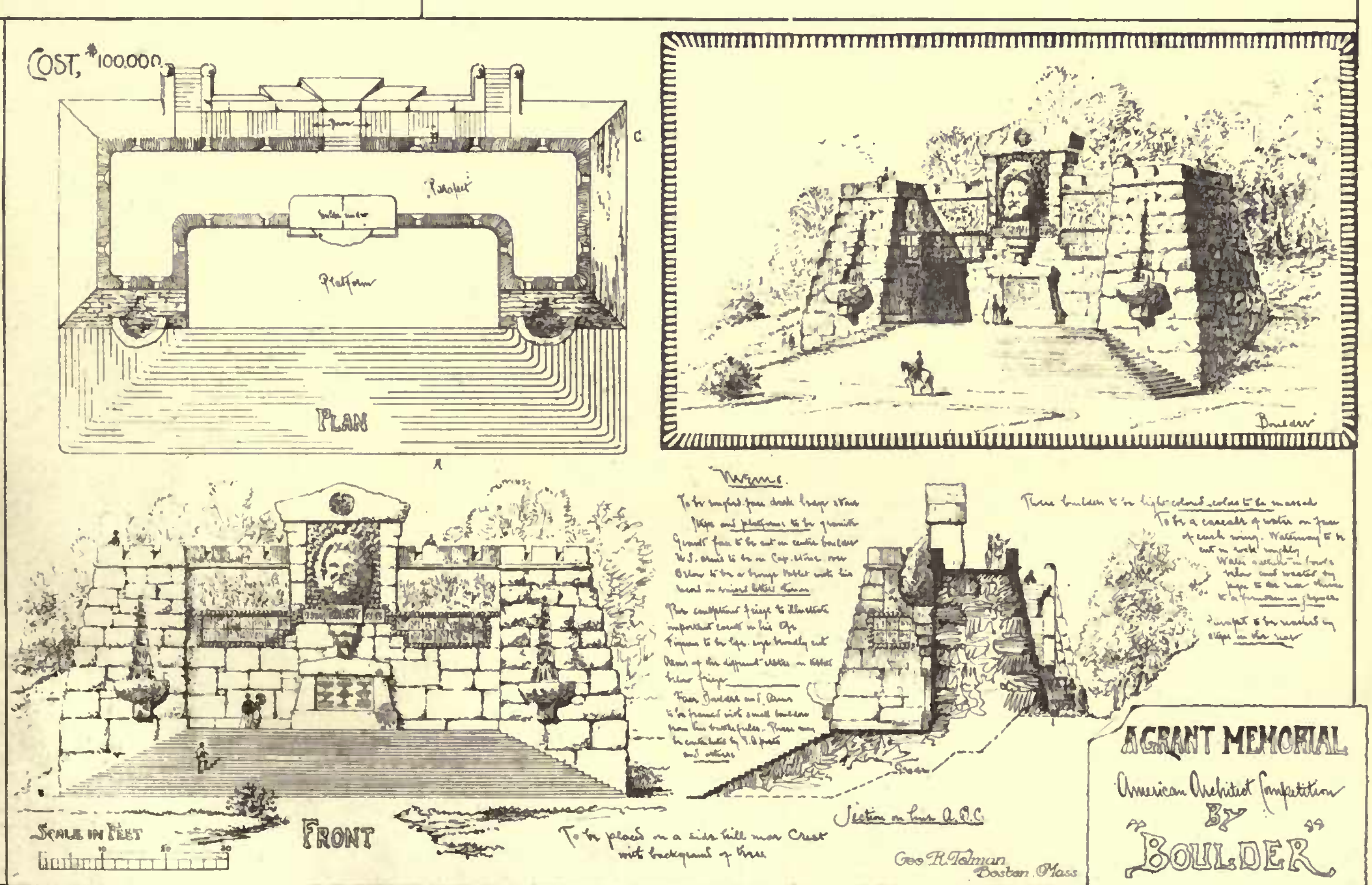
·Material·Granite·and·Bronze·
·approx·cost·300.000·

·For ten or fourteen statues·Grouping·Generals·
·and contemporaries·uniting·War·and·
·presidential·honors.

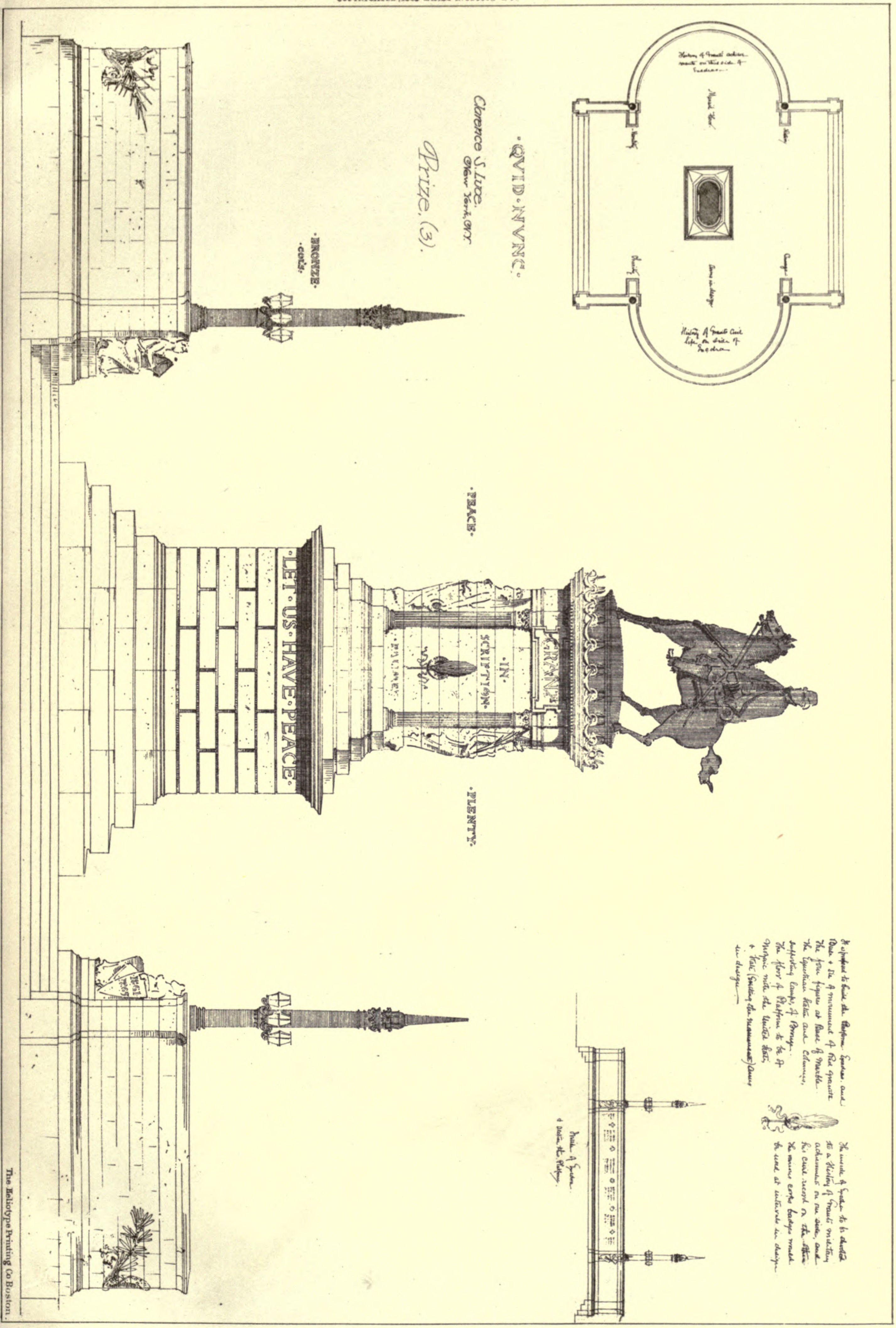

Deathless.
Henry O. Avery
New York. N.Y.



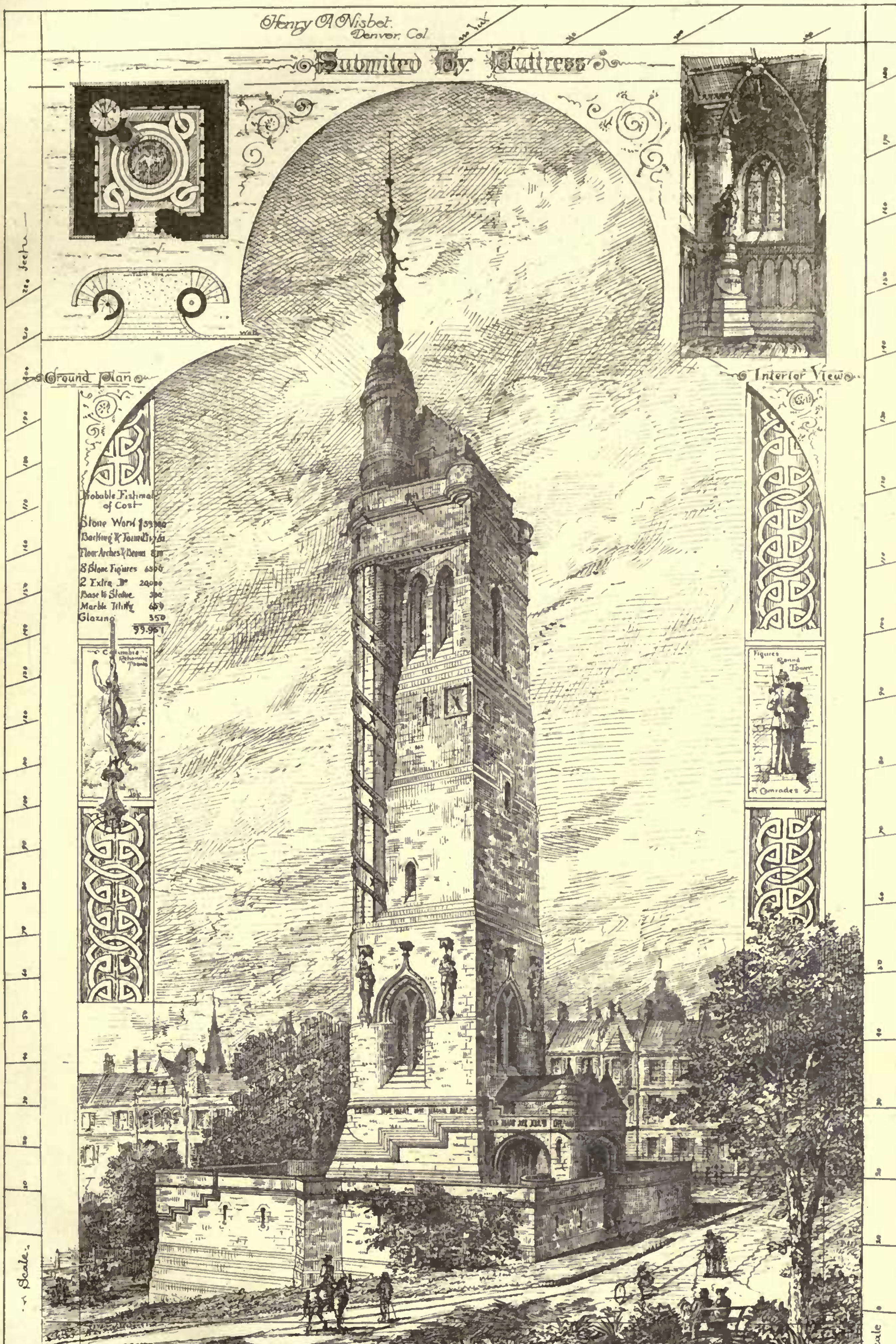

American Architect Competition
For the Grant Memorial
Design Submitted by "Marmontier"
Fred T. Hinds.
Boston Mass.
Plan of Tower at A B
Plans
Note - To be built of granite.
Floor of Vestibule to be tiled
In the centre of Vestibule is an open area looking down on tomb in room below
Room under Vestibule to be lighted by windows on sides.
MDCCCLXXXV


Cost, $100,000.
Platform
Plan
Scale in Feet
Front
Boulder
Notes.
Section on line A. B. C.
Geo R. Tolman
Boston. Mass
A Grant Memorial
American Architect Competition
By
"Boulder"

AMERICAN ARCHITECT AND BUILDING NEWS, SEPT. 26 1885 No. 509
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The Heliotype Printing Co Boston.



DESIGN FOR THE GRANT MEMORIAL.

HELIOTYPE PRINTING CO. BOSTON

ashlar on brick vaulting. The four panels severally refer to Grant as a soldier, statesman, president, citizen. Bronze figure of Fame depositing laurels while holding aloft the emblem of universal peace.

The design by "*Donald*" is described as follows: —

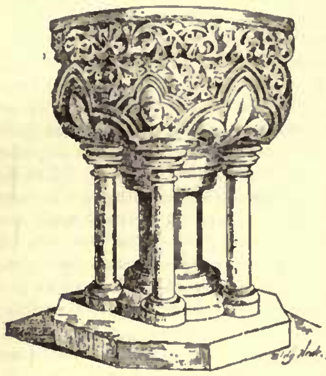
The screen at the right of the platform is to have sculptured panel representing the *military glories*, etc., that at the left the glories of civil and public life of General Grant. All reference to any special actions or to the late war is avoided for obvious reasons. The lions and the group on central pedestal are to be in bronze. The rest of the monument, including figures, is to be of bluestone, such as is used in the Farragut monument in New York City. The central group of bronze figures represent General Grant mounted. The horse is to have a slight forward movement (*à la* the Colleoni monument at Venice) and the four surrounding female figures, representing the four sections of the country (North and South at the front, East and West at the rear) united, the idea being to represent Grant as the great pacificator of the sections of the country. Estimated cost: masonry, $10,000; sculptured work, including bronze figures and groups, $90,000.

The design by "*Grandeur*" bears the following description which the reduction makes illegible: —

Palisades to be cut away at each side on gradual sheer. Tomb at water's edge, with two figures denoting grief at the entrance. Steps up from water on each side to an equestrian statue of General Grant. Behind statue a tunnel connecting with perpendicular shaft which would lead to top of palisades behind.

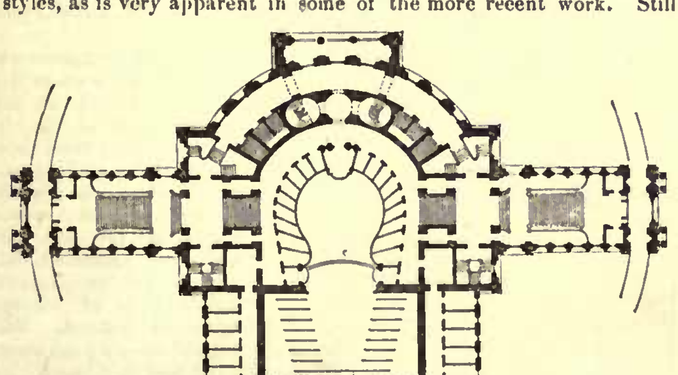
Between smaller Doric columns, statues of other heroes of the war, to be subsequently placed, or bas-reliefs illustrating incidents in Peace or War of Grant's life, with rough rock showing underneath. Friezes above to be used likewise. Equestrian statue to be bronze.

NOTES OF TRAVEL. — VIENNA.



Font: All Saints Ch. Leicestershire Eng.

THE Viennese take a great deal of pride in their handsome, freshly-created city, and fondly cherish a belief in which they expect every stranger to heartily concur, that from an architectural standpoint, at least, it is far ahead of Paris. The average inhabitant would be mortally offended at any more modest comparison. We remember the scorn with which one indignant citizen replied to a slight attempt on the part of the writer to suggest a comparison between his capital and our blooming western city of Chicago. And yet the comparison is not altogether unjust. Both cities have sprung into architectural existence almost within the present generation, both are inclined to be exuberant in their art taste, and both show a decided fondness for wide streets and park boulevards, though on the whole the Lake Shore Drive in Chicago is far ahead of anything Vienna can offer in this last respect. But it is doubtful if any but a Viennese or one who had received a large share of his education in Austria would seriously consider Paris and Vienna as at all on a par, from whatever artistic standpoint the comparison be made. The French so easily lead the world in monumental conceptions that even the Viennese architects themselves admit it by copying Parisian styles, as is very apparent in some of the more recent work. Still



The Court Theatre, Vienna.

the visitor to the city, if not disposed to criticise too closely, will find a great deal to admire. Indeed it is one of the very few places under the influence of German ideas which have, during the past half-century, produced any really good buildings. Vienna also offers some practical problems to the American student not unlike those which have to be encountered at home, and though the architectural taste of the Viennese may be questioned by some, one can surely find enough good material in the city to keep him busy.

The new Court Theatre is rapidly approaching completion. It is located on the Ring Strasse facing the new Rathhaus. The architect is Baron Hasenauer. Externally the design is of the most crude, would-be Charles-Garnier type, and presents nothing which would repay study; but there are some points about the internal arrangement which seem novel and suggestive. The plan given herewith was sketched from memory, after a hurried visit to the building, but is believed to be sufficiently correct to illustrate the general idea. It will be seen that the main approaches and principal stairways are through the wings on each side of the façade. This is quite the reverse of the compact arrangement usually expected of a city theatre, but apparently land is cheap in Vienna, to judge by the way in which it is needlessly squandered on building sites and wide thoroughfares. The entrance wings are placed on the transverse axis of the main hall. The *foyers*, of which there are three at different levels, fill the outer curve of the body of the house, the central projection of the façade affording opportunity for a wide open balcony. The pit is on the ground level, the principal *loges* and the emperor's box filling the first balcony. Unlike the Paris plan, the emperor's box is on the axis of the hall, directly facing the stage. The idea of a circular *foyer* is by no means new, but the placing of the main stairways is a scheme which might be worth using in some city where there are no limitations as to size of lot.

The construction of the theatre is of brick and iron throughout. One or two features are worthy of mention as being different from the methods in vogue with us. The ceilings, and in a few cases the floors also, are constructed as shown by Figure 2. The beams are spaced two to three feet apart, and connected by the iron bars, five-eighths inch square, about sixteen inches on centres, and bent over the flanges of the beams. These bars are in turn united by small rods a little over one-eighth inch in diameter, each rod being wired to the bars. This forms the framework, which can be left until all the rough work about the building is in place. A temporary wooden ceiling is then put up against the under side of the beams, and liquid plaster-of-Paris is poured in above sufficiently to cover and thoroughly protect all of the iron-work. The remaining spaces between the beams is then filled with concrete cinders or plaster in some form.

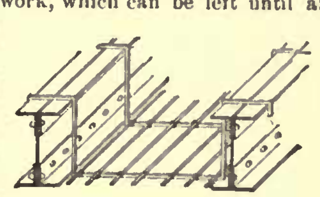


Fig. 2.

This method of floor construction is often met with throughout Austria and Germany, and has so many manifest advantages that it would seem worthy of introduction into the United States, though I have never heard of any instance in which it has been used. The finished plaster-work is applied directly to the under side of the rough coat covering the iron. In America the complaint is often made that when plaster is applied over iron in this manner rust will work out and stain the ceiling, but in Europe it seems to be applied indiscriminately to wood, iron or masonry without bad results.

The partition walls of the boxes are arranged in a rather neat manner. They are mere screens, of course, supporting only their own weight. The partition consists simply of a corrugated-iron sheet, of section as shown by Figure 3, and heavily plastered on each face. The iron appears to be about as heavy as that which is ordinarily used for sliding window-shutters. The sheets are set with the corrugation running vertically, and the finished partition is less than three inches thick. This construction is light, very strong, and almost sound-proof, important considerations for work of this description.

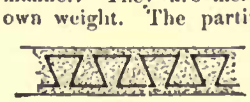


Fig. 3.

My attention was called to some of the brick vaultings supporting the stairways. Somehow German masons, and they include Austrian as well, seem to be able to do more with brick in mechanical ways than builders in America find within their possibilities. These vaultings are very flat, with a rise of hardly more than one in thirty for spans of ten or twelve feet. The bricks are laid herring-bone fashion, as we sometimes lay our hearths and sidewalks, instead of being in regular rings. The superintendent said this work was a specialty of the Bohemian masons.[1]

The small stairs at the rear of the stage are built of stone, on the self-supporting principle so universally employed in Europe, though for some reason rarely and only hesitatingly used with us. Figure 4 illustrates this. Each step is a single stone, built solidly into the wall, while the bottom step is braced against something firm enough to take up any thrust, of which, however, there is practically very little if the joints along the wall are made tight. For lightness of appearance, if not of actual weight, this construction is preferable to iron. When a greater depth of string is desired it can be had, as in the theatre, by the use of stucco, held by clamps to the stone-work, as shown by the figure. Some years since a number of interesting tests were made to determine the strength of this construction. A flight of steps was built upon a circular plan to

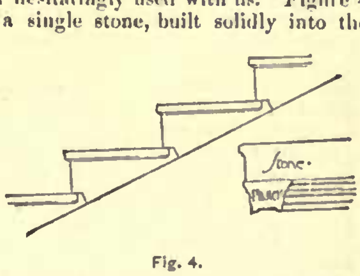


Fig. 4.

[1] For a full description of the Bohemian and Welsh vaults see the *American Architect* for 1876, pp. 299 and 308.

a height of several stories, and a heavy stone, somewhat larger than the well opening, let fall through the centre. It is reported that though pieces were broken off of nearly every step, the stability of the flight was not in the least disturbed.

A short distance from the Court Theatre, on the opposite side of the Ring Strasse, is the extensive building recently completed for the University. The design is in the style of the Roman Renaissance, a trifle boxy, perhaps, but not without dignity, and relatively simple

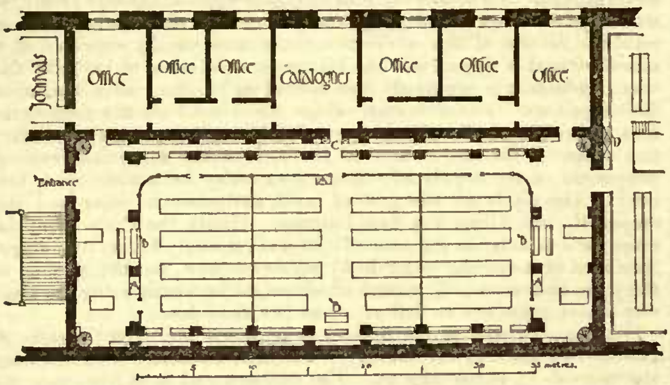


Fig. 5.

enough to be unobtrusive in so showy a city as Vienna. The building was designed by Ferstel. Internally the arrangement is far from pleasing. The plan is unnecessarily confused, and there is a superabundance of large corridors and spacious, monumental stairways, which would seem more appropriate to a palace than to a school; while the carvings so profusely applied to the stone-work are in a thin, late Renaissance style which hardly agrees with the rather sober character of the exterior. The building is rectangular in plan, enclosing a large central court. The entire wing towards the rear is occupied by the library, which is so admirably planned for its purpose as to be well worthy of comparison with the libraries of either London or Paris. Indeed, for compactness of storage room and ease of access to the books, prime requisites in any library, it is hardly equalled in either city. Figure 5 gives the plan of the reading-room, drawn from notes and measurements taken on the spot. Figure 6 shows the approximate section, with the storage rooms above and below. The weakest point in the arrangement is the entrance, which is placed at one side in such a manner that the students who wish to read in the farther section are obliged to pass the whole length of the library before reaching their seats. The more natural way would have been to place the entrance on the central axis of the room, which could easily have been done, as the present stairs apparently are exclusively for access to the library. The librarian said that the reading-room had been modelled after that of the Library of St. Geneviève in Paris, though the only visible resemblance is in the proportions of the plan. A long and rather narrow reading-room seems to be the favorite idea with the planners of the more recently constructed Continental libraries, as distinguished from the circular plan of the British Museum or the square plan of the Bibliothèque Nationale; still it is doubtful if any one who has become thoroughly accustomed to the roomy quiet of the London example would ever feel entirely contented with the long rooms of a type such as the present example.

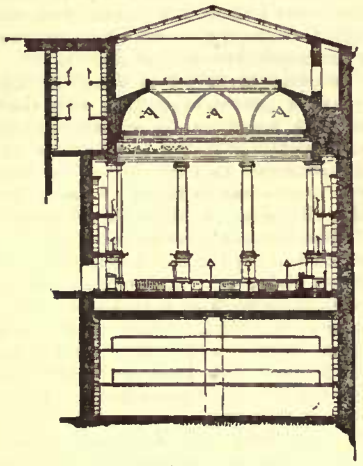


Fig. 6.

As will be seen by the plan, the reading-desks are enclosed by a railing and are arranged in three divisions in order to separate the general classes of readers and so save time in the distribution of books; sciences and the arts occupying the farther section, history and languages the centre, and philosophy and medicine the portion nearest the entrance. The library accommodates two hundred and eighty readers. The desks or tables are of walnut, constructed as shown by Figure 7, with plain wooden tops. Each reader has a separate inkstand, which is built into one of the drawers at the right. No pens or blotters are provided, nor book-rests of any description. The seats are plain wooden chairs. The floor of the reading-room is of marble, by no means a comfortable material for the purpose.

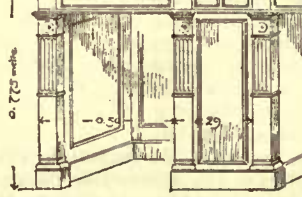


Fig. 7.

Readers are not allowed access to the catalogues, which are kept in the room so marked on the plan. They are compiled in manuscript book-form, the classification being entirely by names of authors. A student desiring a book writes the title and name of author on a slip of paper, leaving it with an attendant at one of the tables, A, Figure 5. The book is brought to the reader's desk and returned to the tables, A. At B are the desks of the librarians in charge of the several divisions. The chief librarian and other officials connected with the management of the library occupy the offices facing the court.

Between the piers at the sides of the reading-room are low cases containing each a single shelf of books and fitted with plain bevelled tops, the lower portion of each being open to allow of introduction of fresh air, as hereafter explained. When the reading-desks are all occupied, readers are allowed to stand at these cases.

The walls of the reading-room are lined with book-shelves arranged in three tiers, the galleries being reached by small circular iron stairs at each corner of the room. The galleries and shelving extend across at both ends, though for the sake of clearness they are not so shown on the section. The shelves contain only the works relating to philosophy and medicine. Readers are not allowed to help themselves to any books in the library, not even to the lexicons. The reading-room is lighted entirely from above by a huge skylight forming the flat portion of the ceiling. The attic space above this, shown by the section, is not utilized in any way. For light during the evening there are two large clusters of gas-jets hanging from the ceiling, besides the argand gas-lamps with which each row of desks is supplied.

The writer was able only to slightly examine the heating and ventilating appliances of the library, but they are essentially as follows: Beneath the entire floor of the reading-room is a chamber, perhaps one metre high. Fresh air, warmed or cooled according to the necessity, is forced into this chamber by means of a fan in the cellar. The air passes into the reading-room through the cases between the piers previously referred to, and is drawn out through the spaces marked A, Figure 6, at the two ends of the room. These spaces are covered with light iron grilles, and open into a narrow chamber from whence the air is drawn down to the basement and thence expelled through a tall chimney, the draught being governed by fans. All of the incoming fresh air is drawn from a single duct leading to a large well in the central court-yard of the university. Great care was taken to prevent the possibility of dust mingling with the air, the earth of the court being removed and its place supplied by a deep bed of clean pebbles. The writer is unable to state where any provision is made for filtering or moistening the air-supply, but judging by the thick deposits of dust in the chamber beneath the reading-room, it would seem likely that the air enters the library in the same condition that it leaves the court.

The greatest ingenuity of the architect has been shown in the disposition of the storage-rooms, of which there are four, one immediately beyond the reading-room, nine tiers in height, extending from cellar to roof; one underneath the reading-room, three tiers high; a long, narrow one above the reading-room at the side; and a large room over the staircase hall. Though the volumes in the library actually number only four hundred thousand, provision has been made for the storage of a million books. The librarian told me a rather interesting fact in connection with the arrangement of the books. At first they were classified entirely by authors and subjects, without regard to size, and it was found that the shelving would accommodate only seven hundred thousand volumes. Subsequently they were rearranged more with regard to size, when there was ample room for a million.

The plan and section show the location of the storage-rooms. Books on science and the arts are stored at the farther end of the library, history and languages going underneath the reading-room, while the storage spaces above at the left and over the staircase hall are as yet unoccupied. Every inch of storage space is utilized. The tiers of shelving are about eight feet high, each tier having a floor of light iron grating carried across the entire area. The supports are all of iron, continuous from bottom to top, the only wood used being for the cases themselves. The construction is essentially as shown by Figure 8. The angle-irons are 50 × 50 × 5 millimetres. The upright bars shown in plan are 130 × 6 mm. and the horizontal bars shown in section are 170 × 6 mm. The diagonal braces are 52 × 7 mm. The floor gratings are in small sections,

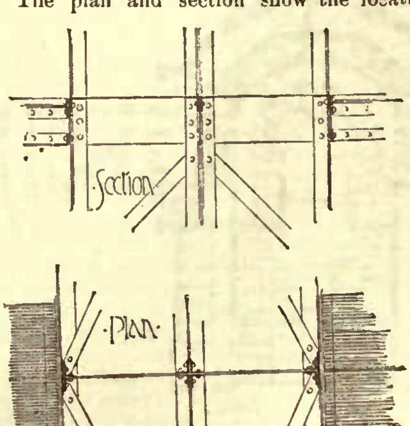
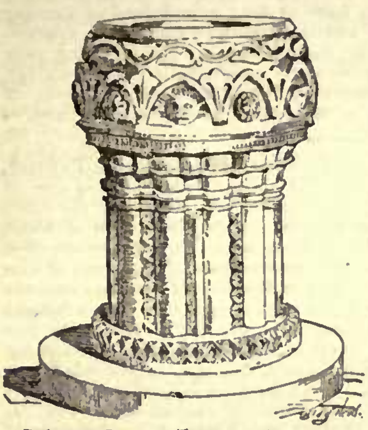


Fig. 8.

capable of being readily lifted out without disturbing the shelving. The bars are 30 × 5 mm., 25 mm. on centres. The book-cases are built so as to have bearing on the two side and the central angle irons. The shelves are movable, resting on iron pins.

The ease with which the books are handled and distributed is quite noticeable. During the busy days, when sometimes every desk in the reading-room will be occupied, attendants are stationed on each floor of the storage-rooms, as well as in the portion under the reading-room, and as fast as books are called for they are sent up or down by small hand-lifts at each side of the doorway, C, and at D, Figure 5. The circular stairs at the corners of the reading-room also give direct access to the store-rooms. C. H. BLACKALL.

THE WATER SUPPLY OF ROMAN CITIES.



Font:—Burrough Church. Leicestershire Eng.

EVERY one has heard of, and many have seen, the splendid aqueducts by which the Roman engineers led the water supply to the capital city. They were nine in number, and it has been computed that their aggregate delivery was equal to a stream twenty feet wide by six feet deep constantly pouring into Rome at a fall six times as rapid as that of the River Thames. This would be equivalent to three hundred and thirty-two million gallons a day, or enough, according to modern practice, for thirteen millions of people. What was done with this immense volume of water is not very clear, for in spite of the love of the bath which the Romans showed wherever they went, they certainly could not use three hundred gallons per head per diem. As the aqueducts were made one after the other their construction must have been instigated by necessity, and hence one may fairly feel a doubt as to the accuracy of the calculations as to the supply; probably some of the sources were not to be depended upon in the dry season, and thus the later aqueducts were designed rather to tap another gathering-ground when the others were affected by drought, than to supply every-day necessities.

The earlier structures were entirely underground, and thus were hidden from observation should an enemy overrun the neighborhood; but the later ones, which were built by the Emperor Caligula when the Roman power was established, were carried in part above ground on embankments and arches. But they all exhibited a gradual fall from source to end, and when a valley was encountered on the route the channel was either carried round it, or if the width was not great, it was supported on arches. From this circumstance has arisen the belief that the engineers of the period were unacquainted with the elementary laws of hydrostatics, and that the idea of taking a line of pipes down one side of a valley and up the other never occurred to them. A champion has, however, arisen for them in the person of Professor W. H. Corfield, who recently laid before the Sanitary Institute of Great Britain the result of his researches into the ancient water works of Lyons, showing that in several places the masonry aqueducts ended in reservoirs at the sides of narrow valleys, and that these must have been connected by lines of pipe following the contour of the ground. The ancient city of Lugdunum (now Lyons) was situated in part upon a hill, on the top of which was the favorite summer residence of several of the Roman emperors. In order to supply the city by gravitation, a source was chosen in the hills of Mont d'Or, and a plentiful supply was found. From this point two subterranean aqueducts were made and joined into one which crossed the plain of Ecully in a straight line underground. But the plain was not continuous, and it was necessary to cross the broad and deep valley now called La Grange Blanche. The aqueduct ended in a reservoir at one side of the valley, and the water was carried, according to Mr. Corfield, in lead pipes down into the valley, across the stream at the bottom by means of an aqueduct bridge six hundred and fifty feet long, seventy-five feet high, and twenty-eight and a half feet broad, and up the other side into another reservoir, and thence along a series of arches into the reservoir in the city, after a course of about ten miles. In the time of Augustus the water was found insufficient both for the city and a large camp which was established in the neighborhood. A second aqueduct was then made from the head springs of a small river called the Brevenne. The structure was underground, and reached the camp after winding round the heads of the valleys for thirty miles. It was nearly two feet wide by about five feet high, and was lined with one and one-fourth inches of cement. The walls were built of quadrangular blocks of stone cemeted together, and the roof was arched.

But neither of these aqueducts came from a source sufficiently high to supply the imperial palace at the top of Fourvières, and it was therefore necessary to construct a third aqueduct. The sources of the stream now called Gier at the foot of Mount Pila, about a mile and a half above St. Chamond, were chosen for this purpose, and from this point there was constructed by far the most remarkable aqueduct of ancient times, and one which demonstrates that the early engineers were by no means so ignorant as some have supposed. The water source was fifty miles from the city, and between the two there lay ten or twelve valleys, one of which was over three hundred feet deep, and about two-thirds of a mile in width. At the commencement of the aqueduct a dam was constructed across the bed of the river, forming a lake, from which the water entered the channel. The course of the water was mostly underground, except when it crossed rivers and small valleys upon arches, until it reached the point where the village of Terre Noire now stands, where it was necessary that it should in some way cross a broad and deep valley. It ended in a large reservoir from which eight pipes descending into the valley were carried across the stream at the bottom on an aqueduct bridge about twenty-five feet wide, supported on twelve or thirteen arches. The pipes then mounted the other side of the valley into another reservoir, from which the aqueduct recommenced to follow a course partly underground, and partly upon bridges. The thirteenth bridge was a splendid structure, nearly one thousand six hundred feet long, and attained a height of fifty-six feet above the ground at its most elevated point. The object of the bridge was to carry the channel of the aqueduct at a sufficient height into a reservoir at the edge of the valley. Some of the arches and the reservoir itself, are still in part intact, supported on a huge mass of masonry. Four holes are to be seen in that part of the front of the reservoir which is left, and these are the holes from which the pipes descended into the valley. The holes are elliptical in shape, being twelve inches high by nine and a half inches wide, and the interior of the reservoir is still seen to be covered with cement. The river pipes descended the side of the valley on a construction of masonry, crossed the river by an aqueduct bridge, and ascended into another reservoir on the other side, entering the reservoir at its upper part just below the spring of the arches of the roof. From this reservoir the aqueduct passed to the next on the edge of the large and deep valley of Bonnan, and here the same arrangement recurred, the bridge across the stream below being eight hundred and eighty feet long by twenty-four feet wide, and having thirty arches. After crossing the bridge the pipes are carried up the other side of the valley into a reservoir, of which little remains, and then the aqueduct was continued to the next valley, passing over three bridges in its course. This valley, that of St. Irenée, is much smaller than either of the others, but nevertheless it was deep enough to necessitate the use of inverted siphons, of which there were eight.

Leaving the reservoir on the other side of this valley, the aqueduct was carried on a long bridge (the twentieth in its course) which crossed the plateau on the top of Fourvières and opened into a large reservoir, the remains of which are still to be seen on the top of that hill. From this reservoir, which was seventy-seven feet long and fifty-one feet wide, pipes of lead conveyed the water to the imperial palace and to the other buildings, near the top of the hill. Some of these lead pipes were found in a vineyard near the top of Fourvières at the beginning of the eighteenth century, and were described by Colonia in his "*History of Lyons*." They are made of thick sheet lead rolled round so as to form a tube, with the edges of the sheet turned upwards, and applied to one another in such a way as to leave a small space, which was probably filled with some kind of cement. These pipes, of which it is said that twenty or thirty, each from fifteen feet to twenty feet long, were found, were marked with the initial letters TI. CL. CAES. (Tiberius Claudius Cæsar), and afford positive evidence that the work was carried out under the Emperor Claudius. Lead pipes, constructed in a similar manner, have also been found at Bath, in this country, in connection with the Roman baths.

It is unfortunate that no trace of the siphon pipes remains, and hence we are left to conjecture as to their nature. Mr. Corfield assumes that they were lead, but if so they must have been different from the distribution pipes mentioned above, as these are evidently very ill-designed to stand a pressure of two hundred feet to three hundred feet head. He suggests that they may have been wound round with strong cords of hemp, in the manner described by Delorme in connection with a similar Roman aqueduct siphon near Constantinople. A lead tube encased with hemp appears a very insecure conduit to people used to cast-iron pipe, but it must be remembered that a considerable portion of the strength of our modern tubes is an insurance against the dangers of transport, bad moulds, blow-holes and the like, as well as against the brittleness which is the characteristic of these castings. Hence a pipe of hammered lead need not be so thick as one would imagine. Those found at Bath were about twelve inches in diameter, and rather more than one inch thick, showing signs of a laminated structure. But judging from the size of the holes at Lyons, the syphon there could not have been more than seven inches or eight inches in diameter, and for this size a thickness of five-eighths inches would be ample for a head of two hundred and fifty feet, provided the joint could be made as strong as the rest of the metal. In a pipe built out of sheet metal and soldered, this would be possible. It is probable that the builders of the viaduct would not trouble themselves about a high factor of safety, as they had some nine or ten pipes in each section, and could therefore afford to have one or two out of use and under repair. If they were wrapped with hemp it would be necessary to renew it from time to time, but this would present no difficulty. Another feasible theory is that the lead pipes were laid in Roman cement concrete and masonry. It is evident that a prepared bed was made for them all the

way, and it would be possible to supplement the weakness of the joint of the lead pipe, by laying the tubes side by side in a central conduit, with heavy retaining walls, and filling the space in solid with cement.

Whatever theory we may adopt, whether we assume that the Roman engineers could make a lead pipe equally strong all over, or whether they had recourse to external ties of hemp, bronze, or cement, there is good ground for believing that they were quite capable of carrying water in inverted syphons, and that therefore when they did not do so, as in the Italian aqueducts, they had good reasons for their practice. It is probable that then, as now, the question of cost was the main consideration, and that metal was exceedingly expensive, especially when it was used at a great distance from the mines. In a time when there were neither railways nor canals the transport of lead pipes overland would be no trifling matter. This is partly shown by the difference in section between the syphons and the main conduit. The latter had ten square feet of cross section, while the former had probably not more than one-fourth of this, so that the rate of flow through the pipes must have been fourfold that in the main channel. It would have been very interesting if Mr. Corfield had carried his researches still farther. We should have liked to learn exactly what was the greatest head to which the pipes were exposed, and what was the difference of level between the inlet and outlet. Works of such magnitude are worthy of a complete description in an age which prides itself in being more devoted to sanitation than all which have preceded it. Whether this belief would bear a complete investigation is open to doubt; at any rate in the matter of water supply it is certain that the pure fluid sought at some expense by the Roman colony at Lyons, was preferable to the purified liquid supplied to London. — *Engineering.*

NOTES AND CLIPPINGS.

A Twentification. — I can to this day smile at her anecdote of the Mayor and corporation of Looe, who, when ordered by the War office to prepare for an expected French invasion, requested, in consideration of the smallness of the town, "to construct a twentification instead of a fortification," and accordingly erected a fort of twenty guns, which, as mother would remark, "remains to this day." — *Mary Howitt, in Good Words.*

Bribing Architects. — Some time since we commented on a trade circular, which was sent us almost simultaneously by several architects, from a firm who offered commissions for placing work in their hands. An Associate of the Institute of Architects has just sent us another document of the same kind, headed "The Lancashire Telluric Cement Co.," and containing the sentence, "If you can influence business among your clients, or specify for its use in your specifications, we shall be pleased to allow commission." Our correspondent, who encloses this obliging offer, observes "It is intolerable that the profession should be insulted in this way." It is intolerable; and if architects who receive these offers of bribes for the use of special materials will forward them to us, we will make public the names of those who attempted to bribe, and that will perhaps put a stop to the practice. The position of an architect, we may explain to the "Co" in question, is that of an independent adviser in the interests of his client, and not that of a tradesman; and he has no right to have any interest in view except that of his client. To send round a circular of the kind alluded to is simply to invite professional men to do a dishonorable thing; and if the tradesman who make such offers do not know that, the sooner they learn it the better. — *The Builder.*

Depredations of the White Ant. — The animal we are in search of, and which I venture to think equal to all the necessities of the case, is the termite or white ant. It is a small insect with a bloated yellowish-white body and a somewhat large thorax, oblong-shaped, and colored a disagreeable oily brown. The flabby, tallow-like body makes this insect sufficiently repulsive, but it is for quite another reason that the white ant is the worst abused of all living vermin in warm countries. The termite lives almost exclusively upon wood; and, the moment a tree is cut or a log sawed for any economical purpose, this insect is upon its track. One may never see the insect, possibly, in the flesh, for it lives underground; but its ravages confront one at every turn. You build your house, perhaps, and for a few months fancy you have pitched upon the one solitary site in the country where there are no white ants. But one day suddenly the door-post totters, and lintel and rafters come down together with a crash. You look at a section of the wrecked timbers and discover that the whole inside is eaten clean away. The apparently solid logs of which the rest of the house is built are now mere cylinders of bark, and through the thickest of them you could push your little finger. Furniture, tables, chairs, chests of drawers, everything made of wood is inevitably attacked, and in a single night a strong trunk is often riddled through and through, and turned into match-wood. There is no limit, in fact, to the depredation by these insects, and they will eat books, or leather, or cloth, or anything, and in many parts of Africa I believe if a man lay down to sleep with a wooden leg it would be a heap of sawdust in the morning. So much feared is this insect now, that no one in certain parts of India and Africa ever attempts to travel with such a thing as a wooden trunk. On the Tanganyika plateau I have camped on ground which was as hard as adamant, and as innocent of white ants apparently as the pavement of St. Paul's, and awakened next morning to find a stout wooden box almost gnawed to pieces. Leather portmanteaus share the same fate, and the only substances which seem to defy the marauders are iron and tin. — *Professor Henry Drummond, in Popular Science Monthly.*

Benares Earthquake-shaken. — The ancient Hindoo faith has met with a severe shock. It is an article of faith with the Hindoos that the sacred city of Benares cannot be shaken by an earthquake because it does not rest upon the earth at all, but upon the back of a tortoise. The earthquake which recently visited Hindoostan gave Benares a good shaking up, and many rickety buildings came tumbling to the ground. Thereupon the Mohammedans laughed and the Hindoos were wroth, as the learned Brahmins openly derided the notion that the city would be disturbed. Hindooism itself has received a telling blow. — *Exchange.*

The National Portrait Gallery. — The suggestion which was made in these columns some months ago that, pending the construction of a proper gallery, the National Portrait Collection should be forthwith removed into safe custody at the Bethnal Green Museum is to be carried out this week. This is the last day on which the wooden shed at present containing the pictures will be open to the public, and the removal from South Kensington will begin to-morrow. It will now only remain for the East Enders, who have so long complained of the dry bones hitherto provided for their entertainment, to show their appreciation of so unique an addition to their museum. By so doing they would make good their claim to permanent consideration in the matter, and might obtain the loan — "temporary" only in name — of some of the pictures at present locked up in the cellars at Trafalgar-square. — *Pall Mall Gazette.*

Threatened Destruction of the Church of St. Julien le Pauvre, Paris. — The "besom of destruction" is about to sweep away one of the oldest of Paris churches. Nearly opposite Notre Dame, on the south side of the river, amidst narrow streets, stands the church of Saint Julien le Pauvre, and from its title it seems to be in a fitting position amidst such an environment. In the improvements of that part of the city which are contemplated, the church is doomed. Its history extends to the sixth century, for it was there that Gregory of Tours lodged when he visited Paris. It was pillaged in the ninth century by the Normans. In 1031 it was made over to the Archbishop of Paris by Henry I, for, as part of the Quartier Latin, it might be considered as outside his lordship's jurisdiction. The Church was used as a university hall in the thirteenth century, and it was the custom of the Provost of Paris to go there to take oath that he would have the privileges of the masters of arts and scholars respected during his term of office. In 1655 it was made the chapel of the old Hôtel-Dieu. Afterwards it somehow became private property, and was allowed to fall by degrees into its present condition. At one time it was proposed to convert the church into a museum of Paris relics. What are left of the groining and sculpture are fine examples of thirteenth-century work, and will no doubt be carefully preserved in the Musée Cluny, which is not far distant from the church. — *The Architect.*

The Tax on Fine Art. — Mr. H. L. Warren writes from Boston to the New York *Evening Post* the following letter: *Sir:* Will you allow me to call attention to one of the many absurdities which disgraces our tariff system? Your columns have always been ready to give publicity to just grievances that affect any part of the community, and though mine may not be new, you will readily admit that it is only by a continual exposure of abuses that we can hope for a better state of things. I have lately returned from Europe after a year's study of my profession of architecture, and have brought home photographs and books of engravings which are necessary to me in the pursuit of that profession. On arrival in Boston I am taxed twenty-five per cent on my purchases. As many of my architectural friends had previously brought in similar matter free of duty, as "implements of trade" (which the law defines to include professional books), I appealed to Washington against the decision of the Boston officials, but that decision was sustained. I am a warm admirer of the thoroughness of thepresent Government, even in the administration of a bad tariff; but I confess I cannot see reason for so illiberal a construction of the law of which I happen to be a victim. It not only has not even the poor excuse of being protection of any industry of this country — for photographs of ancient buildings obviously cannot be produced here—but it is throwing an obstacle in the way of the development of the fine arts in this country which it should be the policy of an enlightened government to encourage. Is not our present tariff a gigantic system of highway robbery?

A Forty-Five Ton Cylinder Jail. — The new jail just completed cost $30,000. Its peculiar feature is that the cells are arranged in the form of a great iron cylinder, which revolves about so that only one cell is at the opening at any one time. This cylinder is three stories high, there being ten cells on each floor. Its weight is forty-five tons, and this ponderous weight is hung from above instead of turning on a track below. The strangest part of the arrangement is that the great cylinder can be turned by a simple crank with very little force, a man with his left hand moving it readily. When all is complete it is the intention to have a little water motor in the basement, and then by simply moving a lever the cylinder will be set to rotating. It is suggested that when there are prisoners who it is feared may be trying to cut out, the cylinder can by a motor be easily kept moving slowly all night, so that the prisoners do not remain long enough in one place to do any mischief, or even to crawl out if they had made a partial break. It seems that prisoners have little chance for escape from this new jail. A cage of iron bars completely surrounds the cylinder in which the cells are. The entrance on each floor is guarded by two doors. The officer standing outside does not have to unlock even the first door, but can swing the cylinder around until the cell appears in which is the desired prisoner, and then by a simple movement the inner door is opened and the prisoner can step out of his cell. Then the officer can open the other door and let the man out, but the other prisoners are way beyond any possible reach of the officer and it is impossible for them to make any break on him while he is taking a man out or putting one in. He can handle any number of men in the same way and they cannot get within reach of him until he chooses to let them. — *Omaha Bee.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

325,667. SYSTEM OF STEAM-HEATING. — Milton Foreman, Philadelphia, Pa.

325,678. HEATING-STOVE. — John H. Keyser, New York, N. Y.

325,680. DRYING AND BURNING BRICKS. — Philip Lichtenstadt, Chicago, Ill.

325,686. PIPE-COUPLING.—Chas. A. May and Thos. Siddall, Trenton, N. J.

325,687. EMBOSSED FABRIC FOR DECORATING WALLS, ETC.—T. McGovern, New York, N. Y.

325,693. SHINGLE-SAWING MACHINE. — Willis J. Perkins, Grand Rapids, Mich.

325,731. MANHOLE FOR FIRE-ENGINE HOUSES. — Elbridge O. Chase, Lynn, Mass.

325,753. WINDOW. — Rafael Martinez, New York, N. Y.

325,754. SASH-FASTENER. — John McCormick and Calvin McKinnon, Laurinburg, N. C.

325,759. DRAW-SHAVE.—William Millspaugh, Middletown, N. Y.

325,761. SPRING-HINGE.—Sidney S. Niles, Chicago, Ill.

325,787. BRICK-BURNING KILN.—Henry R. Cassidy, Delhi, O., and Anthony Fries, Brookville, Ind.

325,820. SEWER.—James H. Clark, Chicago, Ill.

325,834. SASH-FASTENER.—John H. Hamaker, Canton, O.

325,838. BURGLAR-ALARM. — Frederick D. Hill, New York, N. Y.

325,846. SASH-FASTENER. — Charles W. Littlefield, Amesbury, Mass.

325,857. HEATING-STOVE. — John O'Keefe, St. Louis, Mo.

325,858. DEVICE FOR AUTOMATICALLY OPENING AND CLOSING HATCHES OF ELEVATORS. — John T. Pacey, Philadelphia, Pa.

325,859. NAIL. — Edwin K. Page, Worcester, Mass.

325,895. PIPE-COUPLING. — James Agnew, Allegheny, and William Agnew, Pittsburgh, Pa.

325,909. LOCK-HINGE. — Alpheus R. Brown, Jr., Boston, Mass.

325,927. APPARATUS FOR HOLDING AND SHIFTING STAGE SCENERY. — Watson H. Gifford, Fort Hamilton, N. Y.

325,939–940. BRICK-MACHINE.—Lewis B. Kennedy, St. Louis, Mo.

325,912. WRENCH.—Bradford F. Lancaster, Augusta, Me.

325,918. PIPE-REAMER. — Rufus G. Marcy, Kansas City, Mo.

325,962. AIR AND STEAM HEATER. — Geo. Nixon, Jr., Philadelphia, Pa.

325,971. ELEVATOR. — Henry J. Reedy, Cincinnati, Ohio.

325,998. FIRE-ESCAPE.—John Walsh, Cleveland, O.

326,004. HEATER.—Elias S. Wilber, Chicago, Ill.

326,048. KNOB-ATTACHMENT.—Thomas J. Morgan, Woodlawn Park, Ill.

326,055. VENTILATING BUILDINGS. — Ira J. Ordway, Chicago, Ill.

326,056. SKYLIGHT. — Bernard Overman, Washington, D. C.

326,061. DRAWER FOR DRAWING-PAPER AND DOCUMENTS.—Alexander Russell, Hot Springs, Ark.

326,073. SASH-WEIGHT. — Reuben Vosburgh, Oregon, Ill.

326,090. SASH-FASTENER. — Frank A. Bascom, Greenville, Pa.

326,108. METALLIC SHINGLE. — Moses G. Farmer, Newport, R. I.

326,126. SINK-TRAP. — Alois Koegel, Milwaukee, Wis.

326,137–138. VISE. — V. Mumford Moore, Chicago, Ill.

326,169. FIRE-ESCAPE. — Fredrick Steinebach and Herbert Wright, New York, N. V.

326,190. WALL-PAPER. — William Wilson, Edgewater, N. J.

326,277. AUTOMATIC TRAP FOR WASH-BASINS. — William E. Delehanty, Albany, and Edward J. Murphy, Greenbush, N. Y.

326,280. BRICK-KILN.—Willis N. Graves, St. Louis, Mo.

326,288. HYDRAULIC BRICK-MACHINE. — Willis N. Graves, St. Louis, Mo.

326,317. MANUFACTURE OF ARTIFICIAL STONE OR MARBLE.—Scott Mixer, Cincinnati, O.

326,320. DOOR-CHECK. — James E. Newcomb, Rock Island, Ill.

326,325. MEANS FOR OPERATING DOORS AND SHUTTERS.—E. Perkins, St. Joseph, Mo.

326,329. INTERLOCKING SPIRAL MOULDING AS AN ARTICLE OF MANUFACTURE. — Moses Y. Ransom, Cleveland, O.

326,336. FIRE-ESCAPE. — John E. Sandberg and Magnus Akeson, Butte City, Mont.

326,346. HYDRAULIC AIR-PUMP.—William S. Taylor, Huntingdon, Pa.

326,373. SHUTTER-BOWER. — George F. S. Zimmerman, Frederick, Md.

326,374. ROOFING. — Benjamin B. Adams, Roswell, N. Mex.

326,402. COMBINED ANVIL, DRILL AND VISE.—Hiram Childers, El Dorado, Kans.

326,440. STEAM-BOILER.—James McEwan, Detroit, Mich.

SUMMARY OF THE WEEK.

Baltimore.

WAREHOUSE.—Frank E. Davis, architect, is preparing plans for Maurice Laupheimer, Esq., for a four-st'y brick and Cheat River stone building, 57′ x 66′, to be erected cor. Eutaw and King Sts., and to cost $12,000.

BUILDING PERMITS. — Since our last report thirty-one permits have been granted, the more important of which are the following: —

E. K. Boyd, 9 two-st'y brick buildings, n s Baker St., between Calhoun and Gilmor Sts.

Frederick Burger, 4 three-st'y brick buildings, n s Lafayette St., e of Bethel St.

Geo. A. Blake, 4 three-st'y brick buildings, w s Charles St., between Biddle and John Sts.

R. H. Shaddrick, 13 two-st'y brick buildings, commencing s e cor. Monroe and McHenry Sts.

Aug. Hanneman, 5 two-st'y brick buildings, e s Wolfe St., n of Chase St.

Brooklyn.

BUILDING PERMITS. — *North Seventh St.*, No. 76, s s, 175′ w Second St., four-st'y frame store and tenement, tin roof; cost, $6,400; owner, D. Buckley, 76 North Seventh St.; architect, A. Herbert; builders, Lehne & Moran and C. Schneider.

Franklin Ave., s w cor. Park Ave., 2 four-st'y frame stores and tenements, tin roofs; cost, $5,000 and $6,500; owner, Meier, Ten Eyck St., cor. Lorimer St.; architect, A. Herbert; builders, U. Maurer and J. Wagner.

Myrtle Ave., No. 1152, three-st'y frame tenement, tin roof; cost, $4,300; owner, Solomon Wolf, 1154 Myrtle Ave.; architect, Th. Engelhardt; builder, J. Rueger.

Central Ave., e s, 40′ n George St., 2 three-st'y frame brick-filled tenements, tin roofs; cost, each, $3,900; owners and builders, Henry Roth, 219 Johnson Ave. and Leopold Michel, Ewen St., cor. Meserole St.; architect, G. Hillenbrand.

Central Ave., e s, 90′ n George St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,200; owners, etc., same as last.

Evergreen Ave., w s, 25′ s Jefferson St., 2 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, each, $4,000; owner and builder, George Loeffler, Jefferson St.; architect, F. Holmberg.

North Eighth St., s w cor. Fourth St., rear of lot, three-st'y frame (brick-filled) tenement, tin roof; cost, $3,000; owner, Henry Noll, North Eighth and Fourth Sts.; architect, A. Herbert; builders, J. Wagner and U. Maurer.

Stagg St., s s, 240′ w Waterbury St., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, $4,200; owner, J. Schneider, 261 Stagg St.; architect, J. Platte; builder, U. Maurer.

Meserole St., s s, 175′ w Ewen St., three-st'y frame (brick-filled) store and dwell., tin roof; cost, $5,200; owner, F. Pfeiffers, Montrose Ave., near Leonard St.; architect, J. Platte; builders, C. Wieber and J. Rauth.

Halsey St., n s, 395′ e Ralph Ave., 6 two-st'y and basement brick dwells., tin roofs; cost, each, $3,200; owner and builder, Jas. W. Stewart, Quincy St., near Tompkins Ave.; architect, I. D. Reynolds.

Olive St., e e cor. Devoe St., one-st'y brick church with tower, slate roof; cost, $65,000; owner, St. Nicholas Roman Catholic Church, Powers St., cor. Olive St.; architect, Wm. Schickel; builders, W. & T. Lamb, Jr.

Myrtle Ave, s s, about 100′ e Waverley Ave., 3 four-st'y brick stores and tenements, tin roofs; cost, each, $7,000; owner and builder, Cornelius Donnellon, 116 Pacific St.; architects, G. P. Chappell & Co.

Jefferson St., *Nos.* 131 *and* 133, 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $8,400; owners, A. Boegel and R. Eisele, on premises; builders, J. Rueger and J. Armendinger.

Humboldt St., s e cor. Johnson Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,000; owner, A. Stemmermann, Broadway, cor. Lewis Ave.; architect, Th. Engelhardt; builder, C. Schneider.

Evergreen Ave., *Nos.* 343–347, e s, 50′ n Bleecker St., 4 two-st'y frame flats, tin roofs; cost, each, $3,000; owner and builder, Fred. Doering, 876 Bushwick Ave.; architect, Th. Engelhardt.

President St., s e, 112′ e Eighth Ave., 3 four-st'y dwells.; cost, each, $12,000; owner, O. D. Munn, Broadway, cor. Franklin St., New York; architect and builder, C. F. Burckett.

Hamilton Ave., s e cor. Coles St., three-st'y brick store and dwell., tin roof; cost, $5,000; owner, architect and builder, J. F. Nelson, 26 Manhasset Pl.

Pacific St., s s, 465′ e Rockaway Ave., 2 two-st'y frame (brick-filled) dwells., tin roofs; cost, $2,500 and $2,700; owner, Catharine Molloy, East New York; architect, C. L. D'Spalthoff.

Gwinnett St., n s, 121′ e Marcy Ave., three-st'y frame (brick-filled) store and dwell., tin roof; cost, $3,000; owner, Fred. Miller, Gwinnett St., near Marcy Ave.; architects and contractors, E. Woods & Co.; mason, —— Bruchhelser.

Raymond St., w s, 163′ 6″ s Tillary St., gravel roof; cost, $4,000; owner, Wm. J. Durfly, 210 South Oxford St.; architect, C. Werner; builders, E. F. Smith and J. Power.

Fourteenth St., n s, 87′ 10″ e Seventh Ave., 3 three-st'y brick and wood tenements, gravel roofs; cost, each, $4,000; owner, R. F. Clayton, 415 Seventh Ave.; architect and contractor, W. F. Clayton; mason, N. Meyers.

Sixth Ave., e s, 40′ n Tenth St., 3 three-st'y brownstone stores and dwells., tin roofs; cost, each, $9,000; owner, George Wessel, Sixth Ave., cor. Tenth St.; architect, L. Boamer; builder, T. J. Nash.

Palmetto St., n s, 90′ e Broadway, 3 two-st'y dwells., tin roofs, wooden cornices; cost, each, $4,000; owner and builder, Cozzens & Barton, 177 Stuyvesant Ave.; architect, I. D. Reynolds.

Franklin Ave., e s, 100′ s Dean St., 3 two-st'y brick dwells., tin roofs; cost, total, $6,000; owner, J. J. Drake, 397 Fulton St.; architect and builder, J. N. Smith.

Marcy Ave., w s, 75′ s Middleton St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,500; owner and contractor, Jacob Bossert, 284 Rutledge St.; architect, J. Platte; mason, J. Auer.

Chicago.

BUILDING PERMITS. — G. N. Hull, 6 two-st'y flats, Flourney St.; cost, $20,000; architect, Sprague.

C. Remborg, three-st'y flats, 145 Townsend St.; cost, $4,500.

Union Iron and Steel Mills, two-st'y office, 1584 Ashland Ave.; cost, $10,000; architect, Colton.

M. C. Jones, 4 two-st'y dwells., Woodlawn Pk.; cost, $12,000; architects, Burnham & Root.

J. Siktahler, two-st'y dwell., 138 Cornelia St.; cost, $3,000.

Dr. McArthur, two-st'y dwell., 416 Dearborn Ave.; cost, $12,000; architects, Cobb & Frost.

C. F. Jullen, 2 three-st'y stores and dwells., 504-506 Wells St.; cost, $15,000; architects, Ostling & Co.

Mrs. M. M. O'Donoghue, two-st'y dwell., 3623 Prairie Ave.; cost, $5,000; architect, W. H. Drake.

Mrs. M. Hammond, three-st'y dwell., 74 Peoria St.; cost, $7,000; architect, M. L. Beers.

W. Strippelman, two-st'y dwell., 215 Leavitt St.; cost, $5,000; architect, W. Strippelman.

J. L. Hoerbur, three-st'y store and dwell., 501 Fourteenth St.; cost, $8,000; architect, A. Bessler.

K. A. Shaw, 2 three-st'y dwells., 524-526 West Jackson St.; cost, $20,000; architect, O. J. Pierce.

H. Boese, three-st'y store and flats, 698-704 Milwaukee Ave.; cost, $8,000; architect, T. Karls.

H. Berl, two-st'y dwell., 9 Keith St.; cost, $3,500; architect, T. Wolff.

J. Schoulg, three-st'y store and flats, 718 Chicago Ave.; cost, $3,200.

M. A. Hecker, two-st'y dwell., 355 Park Ave.; cost, $4,000.

C. Mathler, three-st'y store and dwell., 365 Fifth Ave.; cost, $3,500; architect, J. Zittel.

J. Eisner, two-st'y storehouse, 125 North Curtis St.; cost, $5,000; architect, H. L. Kley.

Mrs. L. M. Britton, 3 three-st'y store and dwells., 298-302 North Ave.; cost, $16,000; architect, L. Kintarfues.

M. Payne, two-st'y flats, 257 North Ashland Ave.

C. C. Collins, 3 two-st'y dwells., 2201-2205 Prairie Ave.; cost, $20,000; architects, Burnham & Root.

J. Ranwolff, three-st'y store and dwell., 3081 Lock St.; cost, $7,500; architects, Hildinger & Co.

H. Hard, three-st'y store and dwell., 982 Milwaukee Ave.; cost, $5,600; architect, Schnoor.

J. H. Manny, two-st'y dwell., 317 Belden Ave.; cost, $5,000; architect, H. H. Gage.

Hicks Bros., three-st'y store and dwell., 914 West Lake St.; cost, $7,000.

W. Metzger, 5 two-st'y dwells., 165-173 Thirty-seventh St.; cost, $18,000; architect, P. W. Ruehl.

The Board of Education, three-st'y school-house, 96-108 Hudson Ave.; cost, $55,000, architect, J. J. Flanders.

F. R. Otis, three-st'y store and flats, 12 Quincy St.; cost, $8,000; architect, C. Palmer.

W. B. Oliphant, two-st'y flats, 25 Plum St.; cost, $3,500; architect, W. Elliott.

W. Mara, two-st'y flats, 263 Winchester Ave.; cost, $3,000.

D. Haly, two-st'y flats, 350 Winchester Ave.; cost, $4,000.

M. Mueller, 2 three-st'y stores and flats, 135-137 Centre Ave.; cost, $6,000; architect, J. Bruhns.

H. P. Smith, 8 two-st'y dwells., 3248-3262 Cottage Grove Ave.; cost, $30,000.

J. Gideon, two-st'y store and dwell., 35 Miller St.

E. O'Reilly, two-st'y dwell., 3217 Michigan Ave.; cost, $10,000; architect, T. V. Wadskier.

E. B. Smith, 2 two-st'y store and flats, 3142-3144 State St.; cost, $10,000.

M. Bradley, two-st'y dwell., 451 Warren Ave.; cost, $3,000.

G. Schennicke, two-st'y dwell., 587 Larrabee St.; cost, $3,000; architect, J. Bruhns.

J. Beidler, foundation, 142-148 Washington St.; cost, $10,000.

A. Pearson, 3 two-st'y store and flats, 1103-1105 West Harrison St.; cost, $8,000; architect, C. W. Boyington.

A. Lewandowski, three-st'y store and flats, 693 Dickson St.; cost, $6,000.

Cincinnati.

BUILDING PERMITS.—J. Shields, two-st'y brick building, Woodburn and Lincoln Aves.; cost, $4,500.

B. Hasslebrock, one-st'y brick building, Second and Sycamore Sts.; cost, $2,000.

Lincoln Club, remodel four-st'y brick building, Eighth and Race Sts.; cost, $3,500.

John Bolan, two-st'y brick building, State Ave. and Liberty St.; cost, $10,000.

C. Smat, three-st'y brick building, Oliver and Linn Sts.; cost, $5,500.

Benjamin Berger, two-st'y brick building, Poldar St. and Western Ave.; cost, $3,500.

Cost of 17 repairs, $9,550.

Total cost of repairs, $1,380,751.50.

Total number of repairs, 681.

Cleveland.

COLLEGE BUILDING.— Western Reserve Medical College, cor. St. Clair and Erie Sts., brown-stone; cost, $100,000; Thos. Linas, contractor; Coburn & Barnum, architects.

MASONIC TEMPLE. — Cor. Superior and Bond Sts.; stone; cost, $80,000; Cudell & Richardson, architects.

MUSIC HALL.—On Superior St., 90′ x 150′, brick; cost, $65,000; seating capacity, 5,000.

STORES.—Brick block on Euclid Ave., stone front, 72′ x 120′; O. E. King, owner; Thos. Simmons, contractor; Geo. H. Smith, architect.

Brick block, 313 Woodland Ave.; cost, $10,000.

Brick block, Broadway, near Forest St., for Henry Laub, three-st'y, 57′ x 74′; cost, $8,000; Uhl & Koestering, masons; Henry Banks, carpenter; F. C. Bate, architect.

HOUSES. — Frame house on Lincoln Ave., for C. C. Morse; cost, $5,000; Chas. Sackett, builder; F. C. Bate, architect.

ALTERATIONS. — Addition to American Wire Co., on Marquardt St.; cost, $15,000; J. T. Watterson, contractor; F. C. Bate, architect.

Detroit Mich.

BUILDING PERMITS. — Granted since last report are as follows: —

Gordon W. Lloyd, brick and stone parish school, 246 East Woodbridge St.; cost, $10,000.

Wm. Scott & Co., brick store; cost, $4,000.

John Waterfall, brick dwell., 965 Woodward Ave.; cost, $12,000.

Moore & Buchanan, brick dwell., 264 Fourth St.; cost, $3,600.

C. B. Cole, brick dwell., Selden Ave.; cost, $3,800.

Harcus & Lange, brick dwell., 80 Leverett St.; cost, $3,000.

C. B. Cole, brick dwell., 37 Hendrie Ave.; cost, $5,500.

Goff Stenton, two-st'y brick dwell., 27 Hendrie Ave.; cost, $5,500.

Mrs. A. A. Wood, two-st'y brick dwell., Selden Ave.; cost, $3,800.

J. H. Rudell, two-st'y brick dwell., 80 Leverett St.; cost, $3,000.

W. H. Hollands & Son, two-st'y brick dwell., 68-70 East High St.; cost, $8,000.

E. B. Coolidge, two-st'y brick dwell., 41 East Alexandrine Ave.; cost, $3,800.

Chas. Burkheiser, two-st'y brick barn, 575-577 St. Aubin Ave.; cost, $3,300.

C. W. Green, three-st'y brick dwell., 657 Cass Ave.; cost, $4,000.

Donaldson & Meier, two-st'y brick stores, 313-315 Wood Ave.; cost, $8,600.

S. Simon & Son, four-st'y brick storehouse, 371-373 Atwater St.; cost, $5,000.

Henry George, 3 three st'y brick dwells., 126-128, 130 West Fort St.; cost, $19,000.

S. J. Murphy & Co., four-st'y brick chair factory, at the Detroit, Grand Haven & Milwaukee Junction; cost, $35,000.

Bergrin & Halecki, five-st'y brick seminary, St. Aubin Ave.; cost, $30,000.

Bergrin & Halecki, brick school-house, Twenty-third St.; cost, $3,800.

C. B. Cole, four-st'y brick dwell., 757-759-761 Woodward Ave. and 18 West Alexandrine Ave.; cost, $24,000.

H. Carew, four-st'y brick chair factory, Russell St.; cost, $35,000.

H. Carew, brick dwell., 165 McDougall Ave., cost, $6,500.

H. Carew, brick pattern shop, Ferry St.; cost, $3,000.

A. Beaton, brick dwell., 47-49 Lincoln Ave.; cost, $5,800.

J. L. Gearin, brick dwell., 354 Lafayette Ave.; cost, $3,400.

Lane & Deitz, brick store, 96 East Congress St.; cost, $8,000.

H. W. Richie, grain elevator, 238-240 Hastings St.; cost, $5,000.

W. Dupont, double brick dwell., 226-228 Howard St.; cost, $5,400.

S. G. Caskey, three-st'y double brick dwell., 49-51 Seventh St.; cost, $7,000.

J. H. Hunt, addition to the rear of the Sixteenth St. Methodist Episcopal Church: cost, $4,000.

Julien Shelinger, 2 two-st'y brick dwells., bet. Woodward Ave. and John R. St.; cost, $8,000.

A. Morass, two-st'y brick dwell. and barn, East Congress St.; cost, $4,500.

John Waterfall, three-st'y brick and frame dwell., Woodward Ave.; cost, $10,000.

Mr. Gibson, brick dwell., Hancock Ave.; cost, $5,000.

Barney Finn, two-st'y brick store, cor. Hastings and Catherine Sts.; cost, $4,000.

Thomas Sherk & Co., five-st'y brick hotel, 212-214 West Woodbridge St.; cost, $18,000.

Mason & Rice, brick packing-house, Twentieth St.; cost, $15,000.

John Waterfall, two-st'y brick dwell., 945 Woodward Ave.; cost, $11,000.

W. Thurber, two-st'y brick dwell., 24 East Alexandrine Ave.; cost, $3,700.

Henry Engelhert, two-st'y brick dwell., Franklin and Woodbridge Sts.; cost, $9,500.

H. H. Jackson, two-st'y double brick dwell., 505-507 Third St.; cost, $8,000.

Charles G. Baumgart, 2 brick stores to be erected cor. Russell and Ferry Ave.; cost, $6,500.

Minneapolis, Minn.

BUILDING PERMITS. — Henry Brown, four-st'y brick veneer tenement building, e s South Bryant Ave., bet. West Thirty-seventh and West Thirty-eighth Sts.: cost, $27,000.

Geo. P. Derrickson, two-st'y brick veneer dwell., Highland Ave. in Oaklake add.; cost, $3,000.

Carl A. Anderson, four-st'y brick hotel, s s First Ave., bet. Second St. and Washington Ave., s; cost, $9,000.

R. P. Dunningter, two-st'y addition to store building, n e cor. Two Hundred and Forty-second and Hennepin Aves.; cost, $3,000.

New York.

FLATS. — On the n s Twelfth St. bet. Avenues A and B, five-st'y brick and brown-stone tenement, with warehouse on first floor, is to be built for Mr. Peter Schaeffler, at a cost of $20,000; from plans of Mr. W. Graul.

On the w s Second Ave., from Ninety-third to Ninety-fourth Sts., a number of tenements and stores are to be built by Mr. John Schappert.

HOUSES. — On the n s Ninety-fourth St., 100′ e Tenth Ave., Messrs. Squire & Whipple will build 9 three-st'y brick and stone dwells.

On the n s Twentieth St., w Ninth Ave., Mr. Owen Donohue will build 5 four-st'y high-stoop brick and brownstone houses.

SLAUGHTER-HOUSE, ETC. — A quite unique building is that to be altered at No. 10 Governeur Slip, which is to be used as a chicken emporium and slaughter-house. Mr. Jos. M. Dunn the architect has complied with all the requirements of the Board of Health, having specified for Star Rock Asphalt floors, and the most improved system of drainage. The cost of the improvement will he about $15,000.

BUILDING PERMITS. — *Randall's Island*, opp. East One Hundred and Seventeenth St., three-st'y brick workshop, for House of Refuge, peak slate roof; cost, $10,000; owner, Society for the Reformation of Juvenile Delinquents, foot of East One Hundred and Twentieth St., N. Y.; architect, O. P. Hatfield, 31 Pine St., N. Y.; C. R. Terwilleger, mason, One Hundred and Fifty-sixth St. and Tenth Ave.

East One Hundred and Eighth St., s s, 100′ e Second Ave., two-st'y brick dwell., flat tin roof; cost, $7,000; owner, James F. Gray, 546 Ninth Ave.; architect, James D. Darling, 356 Eighty-seventh St.

West Fiftieth St., *No.* 452, five-st'y brick flat, brick and stone front, flat tin roof; owner, Godfrey Haas, 454 West Fiftieth St.; architect, B. A. Bechaldner, 15 Cortlandt St.

Warren St., *No.* 72, five-st'y brick store, stone and iron front, flat tin roof; cost, $50,000; owner, P. B. Parker, 108 East Eighty-seventh St.; architects, Babcock & McAvoy, 64 College Pl.

East One Hundred and Fifteenth St., *No.* 322, four-st'y brick tenement, flat tin roof; cost, $12,000; owner, Henry Neus, 404 East One Hundred and Fourteenth St.; architect, Adam Munch, 307 East One Hundred and Fifteenth St.

Seventy-fifth St., n s, 125′ w First Ave., five-st'y brick stable and loft building, flat tin roof; cost, $10,000; owner, Jacob F. Droste, 330 East Eighty-seventh St.; architect, J. Kastner, 744 Broadway.

Third Ave., w s, 221′ 5″ n One Hundred and Sixty-third St., four-st'y brick tenement-house, flat tin roof; cost, $14,000; owner, Patrick Duffy, 967 North Third Ave.; architects, Schmidt & Garvin, 26 Church St.

Ninety-Fourth St., n s, 150′ e Tenth Ave., 6 three-st'y basement brick dwells., brick and brown-stone front; cost, $63,000; owner, Frank Mulligan, 425 West Twenty-fourth St.; architect, Emile Gruwe, 113 Sixth Ave.

Riverside Drive, e s, 550′ n One Hundred and Twenty-second St., two-st'y brick stable flat tin roof; cost, $10,000; owner, Robert G. Gregg, 2015 Sixth Ave.; architect, J. Kastner, 744 Broadway.

Ludlow St., *No.* 5, five-st'y brick tenement, flat tin roof; cost, $16,000; owner, Patrick H. McManus, 110 East Ninety-first St.; architect, Wm. Kurtzer.

One Hundred and Fifty-sixth St., n w cor. North Third Ave., four-st'y brick tenement, flat tin roof; cost, $14,000; owner, Mary A. Rich, n w cor. One Hundred and Fifty-sixth St. and North Third Ave.; architect, Adolph Pfeiffer, 891 North Third Ave.

ALTERATIONS. — *Grounds of Bloomingdale, One Hundred and Fourteenth to One Hundred and Twenty-second Sts. to Riverside Ave.*, insane asylum, one-st'y add., making four-st'y, mansard roof; cost, $7,500; owners, Governors N. Y. Hospital, on premises; architect, Ralph S. Townsend, cor. One Hundred and First St. and Tenth Ave.

East Tenth St., *No.* 22, brick extension, flat tin roof; cost, $6,000; owner, James Otis, Bellport, Long Island; architect, F. & W. E. Bloodgood.

Broadway, *No.* 1115, hotel known as the Hoffman House, hydraulic elevator: cost, $4,000; owner, Mrs. G. R. Hoffman, 424 West Twenty-third St.; lessees, Cassus H. Reed and Edw. S. Stokes; architect, John B. Snook, 12 Chamber St.

Philadelphia.

BUILDING PERMITS. — *Girard College Grounds*, three st'y white marble building, 110′ x 190′; cost, $138,000; Allen B. Rorke, contractor.

Mechlin St., w of Wakefield St., two-st'y dwell., 18′ x 40′; G. W. Baxter, contractor.

Clinton St., n of Bar St., 2 two-st'y dwells., 16′ x 28′; J. S. Tomlinson, owner.

Fairhill St., n of Cambria St., 2 two-st'y dwells., 16′ x 36′; Brockelhurst & Ewing, contractors.

Arch St., w of Tenth St., four-st'y store, 22′ x 133′; R. W. Strode, contractor.

Herman St., cor. Germantown Ave., three-st'y store, 17′ x 66′; Geo. W. Hearst, contractor.

Germantown Ave., *No.* 4058, three-st'y dwell.; Wm. Kutz, contractor.

Haverford St., w of Budd St., 6 two-st'y dwells.; Frank H. Vodges, contractor.

Twenty-eighth St., cor. Earnest St., 9 two-st'y dwells.; B. P. Evans, contractor.

Forty-second St., near Pine St., 8 three-st'y dwells.; W. S. Kimball, owner.

Bailey St., s of Columbia Ave., 2 two-st'y dwells.; J. E. Dingee, owner.

Venango St., w of Kensington Ave., 3 two-st'y dwells.; Jas. Quigley, contractor.

Oak Lane, near Kirby St., 2 three-st'y dwells., R. J. Kirby, contractor.

Chatham St., s of Green St., 2 three-st'y dwells.; Wm. Lazallere, contractor.

South Nineteenth St., *No.* 1538, two-st'y dwell.; Samuel McClellan, owner.

Harvey St., e of Adams St., 2 three-st'y dwells.; Wm. Garvin, contractor.

Emerald St., n of Ontario St., 10 two-st'y dwells.; Ed. J. Develin, owner.

Thouron St., n of Diamond St., 2 two-st'y dwells.; D. C. Schouler, owner.

Eleventh St., s w cor. Washington Ave., four-st'y factory, one-st'y warehouse and one-st'y boiler-house; J. W. Young, contractor.

Twenty-second St., s of York St., one-st'y mill; E. H. Flood, owner.

Franklin St., w s, near Allen St., 6 two-st'y dwells.; J. & E. Mattis, owners.

Montgomery Ave., near Seventh St., 10 three-st'y dwells.; Thos. McCoach, owner.

Norwood Ave., Chestnut Hill, two-st'y stone stable; C. R. Kohl & Bro., contractors.

Germantown Ave., *No.* 2312, three-st'y dwell.; Henry G. Shultz, contractor.

Norwood St., *No.* 821, three-st'y dwell.; Nutz & Worthington, contractors.

Chestnut St., w of Thirty-seventh St., three-st'y dwell.; Stacey Reeves & Son, contractors.

St. Louis.

BUILDING PERMITS. — Seventy permits have been issued since our last report, seventeen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

P. Tucker, two-st'y brick and stone store and dwell.; cost, $6,400; Bothe & Rotterman, contractors.

F. C. Kinkrad, two-st'y stone dwell.; cost, $3,000; P. Brennan, contractor.

Mary E. and Susan Hewett, two-st'y brick dwell.; cost, $3,000; C. F. Aufderheide & Co., contractors.

Henry Saulsmann, two-st'y brick store and dwell.; cost, $2,500; contractors, same as last.

M. Tercks, 2 adjacent two-st'y brick tenements; cost, $2,600; Kluthe & Boeke, contractors.

J. C. Newberry, two-st'y brick dwell.; cost, $2,500; J. C. Newberry, contractor.

A. G. Loring, 3 adjacent two-st'y brick tenements; cost, $4,000; J. B. Legg, architect; W. J. Baker, contractor.

C. C. Murphy, two-st'y brick dwell.; cost, $3,800; C. C. Murphy, contractor.

Wm. L. Miller, two-st'y brick store and dwell.; cost, $3,200; Aug. Beinke & Co., architects; C. H. Poertner, contractor.

Geo. W. Simpkins, three-st'y brick dwell.; cost, $18,000; Eames & Young, architects; F. S. Green & Co., contractors.

H. Staunn, 2 adjacent two-st'y brick tenements; cost, $7,000; Paulus & Weidemuller, contractors.

P. White, two-st'y brick dwell.: cost, $4,000; J. B. Gosse, architect; J. O'Malley, contractor.

G. Miller, two-st'y brick dwell.; cost, $2,500; B. Koerster, contractor.

Wm. H. Thompson, four-st'y brick store; cost, $21,000; H. G. Isaacs, architect; contract sublet.

Wm. M. Dietring, two-st'y brick store and dwell.; cost, $4,000; Francisco & Farnum, contractors.

Good Samaritan Hospital, three-st'y brick addition to hospital; cost, $3,500; A. Beinke, architect; H. Schulte, contractor.

H. Hanibal, three-st'y brick tenement; cost, $2,800; B. Goesse, architect; Goesse & Roberts, contractors.

Henry Miller & Chas. Grisheimer, 2 adjacent two-st'y brick store and dwell.; cost, $3,600; Johnson, architect; F. Offermann, contractor.

Capt. L. H. Cunn, two-st'y brick dwell.; cost, $12,000; J. B. Legg, architect; A. E. Cook, contractor.

Hill Bros., altering two-st'y brick warehouse; cost, $3,600; Wm. Atchison, contractor.

W. H. Lee & Co., altering one-st'y brick store and tenement; cost, $5,400; J. H. McNamara, architect; O'Malley Bros., contractors.

Jos. Murphy, 3 adjacent two-st'y brick tenements; cost, $3,300; Theo. Gugerty, contractor.

St. Paul, Minn.

BUILDING PERMITS. — Three-st'y brick store and offices, e s of Jackson St., between Fifth and Sixth Sts.; cost, $5,000; owner, Granville Browning, Chicago, Ill.

Two-st'y brick stable and shop, n s of Fifth St., between Wabasha and Cedar Sts.; cost, $2,150; owner, St. Paul Water Board.

Two-st'y brick store and dwell., n s of Concord St., between Add and Anita Sts.; cost, $2,400; owner, Joseph Anstelt.

Two-st'y frame dwell., n s of Portland St., between St. Albans and Dale Sts.; cost, $2,000; owner, G. H. Lewis.

Two-st'y frame dwell., s s of Bayless St., between Railroad and Blake Sts.; cost, $2,350; owner, "St. Anthony Park Co."

Two-st'y frame dwell., cor. Vane St.; cost, $2,300; owner, same as last.

Two-st'y frame double dwell., n s of Iglehart St., between Farrington and Lewis St.; cost, $2,400; owner, A. Collatz.

Two-st'y frame dwell., n s of Fairfield St., between Water and Edward Sts.; cost, $2,000; owner, Margaret Cranston.

Three-st'y brick store and dwell., w s Dakota Ave., between Chicago and Indiana Sts.; cost, $18,000; owner, Albert M. Lawton.

General Notes.

ABERDEEN, DAK. TER. — The Aberdeen Farmers' Elevator Co., O. H. Bliss, President, received bids for 25,000-bushel elevator, August 8.

ATLANTA, GA. — Corner-stone for the new Capitol of Georgia was laid September 1. The building is being built of oolitic stone, will cost $1,000,000, and will be completed in four years.

BERLIN, N. H. — The Glen Manufacturing Co. is building a pulp and paper mill, which will employ 200 operatives.

BRYAN, O. — Two-st'y brick dwell., for J. Moore; cost, about $7,500; E. O. Fallis & Co., architects.

CLEARFIELD, MINN. — Mr. Blair, of Eyota, will in a few days begin the erection of an elevator at Chatfield. This will give Chatfield the benefit of three grain firms and four elevators.

CONCORD, N. H. — Hon. B. A. Kimball, Gen. A. D. Ayling, and Edward Dow of Concord have been appointed a committee to superintend the erection of a state arsenal in this city, under joint resolutions passed by the Legislature in 1879.

DERRY, N. H. — Pinkerton Academy is to have a new building, 50′ x 100′. Two years will elapse before it is completed.

DUBUQUE, IOWA. — Contractor Bailey has now under way: The Phillips block on West Locust street, two stories and basement, 44′ x 50′ addition to S. Green & Son's Foundry, 50′ x 50′ on West Second st; and two large smoke houses for the Des Moines Packing Company.

Mr. W. S. Gally has let the contract a three st'y brick building 44′ x 110′ on East Locust st., between Sixth and Seventh.

EASTHAMPTON, MASS. — Lumber is being drawn for the new Episcopal church, and it is expected that the building will be roofed in before winter.

FORT HARKER, KANS. — General Keifer has just returned to Springfield, O., from Kansas, which he visited in the interests of a Springfield syndicate that is negotiating for 4,000 acres of land at Fort Harker, on which to build a manufacturing town. General Keifer is interested and expects great success from the scheme.

JAMESTOWN, R. I. — A meeting of the committee, and of those interested in the project to build a chapel at Conanicut Park was held at the park on Tuesday evening, and enough money having been secured to warrant the undertaking of this enterprise, it was voted to begin the structure this autumn.



BROAD STREET STATION OF THE PENNSYLVANIA RAILROAD, PHILADELPHIA, PA.

WILSON BROS. & CO., Architects.

Heliotype Printing Co., Boston.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. No. 510.

OCTOBER 3, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE annual meeting of the American Forestry Congress, held in Boston a week or two ago, seems to have been an important occasion, and some aid must certainly have been given to the cause of forest preservation by the interesting and valuable papers read before it. The most effective address was perhaps that of Mr. Eggleston, the chief of the forestry division of the Department of Agriculture at Washington, who gave some rather startling statistics in regard to the consumption of timber in this country. Referring to a chart which he had prepared, showing the extent and distribution of the forest-covered portions of the United States, the speaker mentioned the railroads as among the principal consumers of timber; about ninety-two million ties being used every year for constructing new roads and preparing old ones. To furnish lumber for this purpose alone would lay waste every year a tract of forest equal in area to the State of Rhode Island; while if only the regular product of a well-kept forest were employed for the purpose, using the trees as they came to maturity, without destroying the saplings, a tract of fifteen million acres would be required to maintain a continuous supply of ties; an area almost exactly equal to that of Vermont, New Hampshire, Connecticut and Rhode Island combined. Contrary, perhaps, to the common idea, by far the largest item in the consumption of wood is for fuel, the amount of lumber used in this way every year being, according to the census, nearly fourteen times as great as that converted into building material, and requiring, to supply it, the annual devastation of thirty million acres of forest land, an area about equal to that of the State of New York or North Carolina. According to the same authority, forest fires consume every year about one-third as much wood as is burned by steamboats, locomotives and household stoves and fireplaces throughout the United States, laying waste annually more than ten million acres of forest land, or an area equal to that of Massachusetts and New Jersey combined. Taking all forms of timber waste and consumption together, the annual drain in the United States results virtually in the clearing of fifty-one million acres of woodland. How long the supply will last at this rate may be inferred from the fact that, according to the investigations made for the last census, the entire area of woodland within the limits of the United States is, approximately, four hundred and forty-one million acres. The total area of farms is two hundred and ninety-six million acres; and the remaining area of the United States, amounting to eleven hundred and fifteen million acres, consists, with the exception of the insignificant territory included in the cities, entirely of unimproved, waste and abandoned lands, to which additions are made every day. Something has been done in the Western States in the way of planting trees, and it is said that four million saplings have been planted in Kansas and the neighboring States in a single day, but this was on the one day out of the whole year specially devoted to tree-planting, and, at the best, it represents an amount of timber far less than the regular average consumption of every day in the year, and much more must be accomplished before there will be a prospect, however faint, of our being able to maintain the supply at anything near the demand. Meanwhile, millions of acres of exhausted farming land lie idle in all our older States, close to a market of almost infinite capacity, in which forests might be made to grow with the least possible trouble, and the greatest possible profit. In many cases these colonial farms are already covered with worthless underbrush, and there are few, if any, where a small investment now would not pay a rich profit twenty or thirty years hence.

ONE of the most singular cases of indirect damage from fire which has occurred for a long time is recalled to our memory by a paragraph in the *Fireman's Journal*, which, in speaking of a fire which recently broke out in a storage warehouse in Boston, says that the bales were so closely packed against the windows that no water could be thrown through the latter, and the firemen were obliged to break through the roof in order to put the fire out. The *Journal*, very properly, condemns this careless way of packing, which is too common in buildings of the kind, but its condemnation would have had additional point if it had known the sequel of the fire to which it referred. The particular building in question, being intended merely for storage, was constructed with bare brick walls, and as little superfluous wood-work as possible. There was, therefore, almost nothing to burn in it, except the jute with which it was filled; and the warehouse manager perhaps thought, not without reason, that close packing of the bales would be likely to prevent rapid combustion of their contents. However that may be, the jute caught fire, and, as the *Journal* says, was put out by pouring water over it from the roof. The fire does not seem to have gained much headway, but the firemen, probably knowing the danger of leaving bales with sparks smouldering in them, saturated the goods pretty thoroughly, and then left the building. The close-packed bales of jute swelled, by the absorption of the water, exerting a force so great as to throw out the walls, not only of the building in which they were contained, but of the two adjoining ones, causing a serious and quite unexpected loss.

IT seems to us that some one might do his fellow-citizens a good turn by telling the truth about the fire-extinguishing hand-grenades which are sold now in such enormous quantities. There are so many varieties of them that we will not attempt to say what they are all filled with, but, so far as we have been able to ascertain, not one gives out, when thrown into a fire, any of those efficacious gases which they are popularly supposed to contain, and we have yet to hear of any which possess more virtue than inheres in a bottle of salt and water, or of alum solution; while the disadvantages of their employment are considerable. It is not many weeks since smoke was discovered, early one morning, proceeding from between the floor-boards in our own office, and a rush was made for the hand-grenades by the few persons who happened to be in the building. A wash-stand with two faucets stood within ten feet of the smoking floor-boards, just outside the door of the room, and pails and pans were not far off; but instead of availing themselves of this obvious means of attacking the faint threads of smoke which were alone visible, the amateur firemen threw their grenades apparently at random over the room and the adjoining closet, completely ruining with dark chemical stains every object of value upon which the liquid contained in them was spattered, but of course producing no effect upon the fire beneath the flooring. Finally a four-inch hose was dragged into the room from a stand-pipe near by, and, after cutting a hole through the floor, a stream was turned in large enough to drown a lively conflagration, completing the destruction which the perfectly useless hand-grenades had begun, and, like them, accomplishing nothing which two quarts of water, applied with a little common-sense, would not have done equally well, without incidentally spoiling a considerable part of the contents of the office, as well as of that under it. If the grenades contained nothing but water in a convenient shape, there would be no great objection to them, but the mystery of the ingredients which fill them gives them a false value in the eyes of the ignorant, who forget all about using the water-pails close at hand in their anxiety to

invoke the mighty genii of the blue bottles, and thus throw away the precious opportunity which, in fires, never comes but once, and lasts only a few seconds.

A PAPER was read last year before the Society of Arts in Boston, by Mr. Percival Lowell, on the architecture of the almost unexplored country of Corea. The inhabitants of Corea, as is well known, although more than half Chinese, retain a certain individuality of their own, which they guard rigidly against any innovation. Among their peculiarities the construction of their houses is one of the most remarkable. Like the Japanese, the Coreans build light structures of wood, filled in with screens of paper, but the latter know nothing of the endless ornamentation which makes the paper-covered houses of the Japanese so interesting, and the Japanese custom of setting dwelling-houses directly on the street is offensive to the Coreans, who seek to give dignity to their habitations by making the approaches to them particularly imposing. For this purpose an outer "arrow gate" guards the entrance to all dwellings of importance, and inner gates and arches, opening sometimes into successive courtyards, serve, by repeatedly obstructing the visitor's way, to bring him into a suitable frame of mind for appreciating the exalted character of the personage whom he has come to see. The arrow gate, although a simple affair, is made to present a great deal of impressive symbolism to the superstitious natives. Two tall posts are set, one on each side of the passage, with their tops slightly inclined toward each other. Across these are placed two horizontal sticks, a little distance apart, lashed to the uprights. Resting on the lower cross-piece is a row of spear shaped pieces of wood, set with the points upward, and secured to the upper transom, above which they project a short distance. These are the "arrows," which a very ancient tradition connects in some way with the worship of the divine ancestors of the king; and the whole is painted of a bright red color. Besides the arrows, the gate bears a design consisting of two spirals, coiled in a circle, which, according to Mr. Lowell, "signify the positive and negative essences of Chinese philosophy," and above them is a representation of flames.

THIS portal is commonly placed across the street, some distance from the mansion to which it belongs, as if to prepare the wayfarer in good time for the august dignity to the seat of which he is approaching, but no further demand is made upon his patience or capacity for reverence until the outer gate of the house itself is reached. This gate combines the qualities of a doorway and a triumphal or commemorative arch. It is usually left open, although provision is made for closing it on occasion, and is decorated with an appropriate title, after the Chinese manner, such as "the Gate of Early Spring," the "Gate of Virtuous Contentment," or something of the kind. The construction of these moral entrances, unlike that of the red arrow portals, is quite massive. They are almost always of stone, with three arches, and support a wooden pavilion, or room with open sides; which is occupied in summer by musicians, whose melody is thus divided impartially between the loungers in the street and the inhabitants of the house, this being placed at the opposite side of a court-yard, to which the arch gives entrance. In some cases several of these gates open into as many successive courtyards, all of which must be traversed before the house is reached. Whether music is in such instances provided at each gate does not appear, but the gallery over the outer gate is always furnished with a large drum, which serves to transmit certain sorts of intelligence from the proprietor of the establishment to his fellow-citizens outside. At the end of the last courtyard the dwelling-house is found, raised upon a platform of stone or earth, two or three feet high, which is enough larger than the building to give a narrow terrace all around it. Although simple in appearance, the platform is really honeycombed with flues, which run in a circuitous course from a large fireplace built on the outside, in the middle of one side of the platform, to a horizontal exit at another point. In the better class of houses the flues are constructed with short stone piers, carrying slabs of stone, which form the floor of the house above, but in many cases tunnels in a mound of earth answer the purpose. In winter, which is there a season quite as cold as with us, the exterior fireplaces are filled with brush-wood, the smoke of which, when the fire is kindled, finds its way through the passages to the outlet, warming the floor on its way, just as in the ancient Roman hypocaust. Notwithstanding the flimsy construction of the houses built upon the platforms, the hypocaust floors, when well warmed through, are capable of heating the rooms over them very effectually. Although the thermometer outside sometimes sinks to fifteen or twenty degrees below the Fahrenheit zero, the rooms, which are closed as tightly as possible, become so hot that, as Mr. Lowell says, the occupant is, "slowly roasted," and the stone flooring slabs would become unbearably hot if they were not protected by a layer of earth, above which is laid oiled paper.

IN the summer, which is as warm as the winter is cold, the upper part of the house is transformed into an open shed. There are, properly speaking, no walls, the building consisting of posts, set usually at the corners and in the middle of the sides, and supporting a curved roof, of the Japanese pattern, which is covered with black tiles. Between the posts are hung pairs of doors, covered with oiled paper, which are closed in winter, but in summer are taken off the hinges, and hung to the ceiling to be out of the way. In the sleeping rooms, where the total absence of walls would at times be inconvenient, panels, covered with oiled paper, are set between the posts, and sliding doors run behind these, which can be drawn together at night. There are no windows, all the light coming through the oiled paper which covers the doors and panel-work. In most cases the oiled paper is left of the natural color, but colored paper is sometimes employed, and occasionally a little decoration is put upon portions of the panelling. A few mats, a cabinet of the familiar Japanese type, and perhaps a screen or two, complete the furnishing. Outside, an unintended picturesqueness is usually given to the building by the vegetation of the seeds contained in the clayey mud used for bedding the tiles of the roof, which send out a plentiful crop of grass through all the interstices of the tiling.

EVERY one knows, in a general way, that when a fire breaks out in a French house, occupied by several tenants, the tenant in whose apartment it begins is held responsible for the consequences, but the details of the law governing such cases are not so well known here, and the report of a recent dispute decided by a French court, which we find in the *Moniteur des Architectes*, has a certain interest. It seems that "the Spouses Voland," in the legal phrase, occupied an apartment in the house of "the Sire Gourd," in Lyons. A fire broke out in the rooms of the Spouses Voland, without, however, any indication of fault on their part, and injured the building to the amount of eight hundred and twenty-four dollars and ninety-seven cents, according to the report of the official expert, their own apartment naturally suffering the greater part of the damage. The house was insured as a whole in the Phœnix Company, but the Voland pair had insurance of their own in the Urban Company, which had incidentally, as it seems, assumed such damages as they might be called upon to pay in consequence of fires in their rooms. The Phœnix Company, as insurer of the building, was obliged to pay the whole loss, but called upon the Urban Company, as representing the Volands, to reimburse to it the sum which they would legally have been bound to pay. The Urban Company claimed that, under the Code Civil, the Volands were liable only for a part of the total damage, proportionate to the ratio existing between the rent which they paid and the whole rental of the house. Their rent was two hundred and twelve dollars a year, while the whole rental of the house was fourteen hundred and four dollars, and a simple sum in proportion showed, to the satisfaction of the Urban Company, that it was only liable, on behalf of its policy-holders, for one hundred and four dollars and a half, which it tendered accordingly. The Phœnix company refused this tender, claiming that the Volands were bound to pay the whole of the damage caused to their own apartment, amounting to seven hundred and forty dollars; and brought suit against the Urban Company for this sum. The court, however, decided that the position of the Phœnix Company was untenable, being contrary both to the letter and spirit of the law, and held that the offer of the Urban Company was "good, valid, and satisfactory," and that the Phœnix Company must accept it in full payment of its claims, and must, also, pay the costs of the suit.

ODD BITS OF OLD PLUMBING.—I.

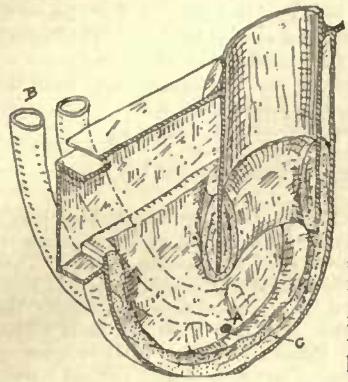


Fig. 2.—Sectional View of D-Trap, with Deposit.

A. Small Inlet from two waste-pipes.
B. Waste Pipes.
C. Deposit.

THE Museum of Hygiene, United States Navy Department, located in Washington, and in charge of J. M. Browne, Medical Director, U. S. N., has for several years been collecting material valuable and interesting to sanitarians.

Here is a library of some eight thousand volumes and four thousand pamphlets treating of hygiene and sanitation. To this library additions are constantly being made, and it will soon be, if it is not at present, the most valuable and useful sanitary library in this country. Here also may be seen actual and varied appliances relating to plumbing, heating, ventilating, disinfecting, etc., set up and in actual working order.

Among these, few, if any, are more interesting than a number of pipes, traps and pieces of metal that have been taken from old houses and have been in actual use for varying periods of time. These specimens I have thought of sufficient interest (to architects and other sanitarians) to illustrate and describe, as they show the formation of deposits in traps and pipes, the chemical action of matters contained in sewage, sewer air and water on metals used in plumbing, and the attacks of vermin on plumbing fixtures. From any of the above causes a system of plumbing is likely to become useless, as it is also liable to fail sometimes from settlement in the building or from expansion and contraction due to changes in the temperature.

In these specimens on exhibition at the Museum, and which I propose to describe and illustrate, are found good examples of each class. The lead D-traps were taken from beneath closets, and were presented to the Department by S. Stevens Hellyer of London, well known by his two books on plumbing practice. Being a member of the large firm of Hellyer & Dent, London, has given him exceptional opportunities for collecting these specimens.

DEPOSITS.

The deposits are interesting, as they show how such matter can and does sometimes collect in traps, and how such waste-pipes as are little used can become completely stopped by deposits, when they are run into the trap beneath a closet. Tell-tale, safe-waste and overflow pipes come under this head.

Figure 2 is a longitudinal section of a lead D-trap, with two waste-pipes branching into it below the water-seal. The incrustation, which does not extend above the water-line of the trap, is from three-quarters to one and a quarter inches thick.



Fig. 1.—Graphic Scale of Inches for Figs. 2 to 13 inclusive, and Figs. 18-20.

Although the waste-pipes are at the first glance completely closed, there is a small hole three-eighths of an inch in diameter, which may have served as a passageway for the water as it trickled from one if not from both of the waste-pipes.

The deposits above the water-line can scarcely be called appreciable, yet there are one or two thin pieces of dried-up organic matters, no thicker than paper, still adhering to the side of the trap. For the constituents of this crust see Analysis No. 1.

There are three other specimens of D-traps showing practically the same formation and character of deposit. The manner in which waste-pipes that run into a trap below the water-seal may be completely or practically closed by deposits is clearly shown in Figures 3 and 4. In the first the branch was an overflow from a cistern. How much service such an overflow would have been in case of sudden need can be easily imagined. The deposit in this case is clearly stratified and from three-eighths to three-quarters of an inch thick. It varies in color from a creamy white to a positive brown, and is confined strictly to the water-line of the trap (see analysis No. 1). In the waste-pipe the deposit is nodular, instead of being stratified. There is a crevice behind the deposit shown in Figure 3, through which water has apparently trickled from the waste-pipe. This opening is not large enough to have been of any service in case of a sudden overflow. In the outlet of this trap corroded perforations may be seen like the ones described and illustrated in Figure 10.

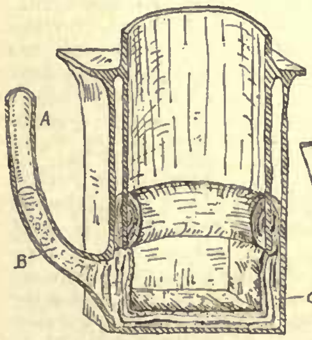


Fig. 3.—Cross-Section of D-Trap, cutting through Waste-Pipe.

A. Waste-Pipe.
B. Nodular Deposit.
C. Stratified Deposit.

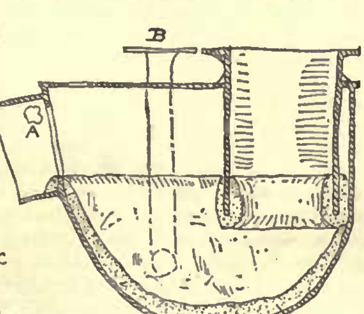


Fig. 4.—Section (longitudinal) of D-Trap.

A. Corroded Hole.
B. Safe-Waste.
C. Deposit.

Another example shows a section sawed from the bottom of a D-trap (Fig. 5). A small hole extends through the deposit and its leaden cover. In cutting the section a part of the lead has been torn away without in any way affecting the deposit.

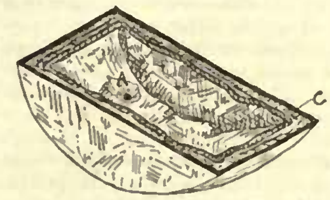


Fig. 5.—Bottom of D-Trap sawed off.

A. Small hole.
C. Deposit.

A curious specimen is shown in Figure 6, a D-trap taken from beneath a closet that had been used exclusively by women. The three-quarters of its area closed by deposits, while the bottom of the trap is comparatively free. The supposition is that the inlet pipe, instead of being properly flushed by the discharge, the waste matter and water was allowed to run out slowly over the surface of the pipe and form a deposit. The waste from some fixture that opens into the trap is completely choked up two or more inches in length (for character of deposit see Analysis No. 1).

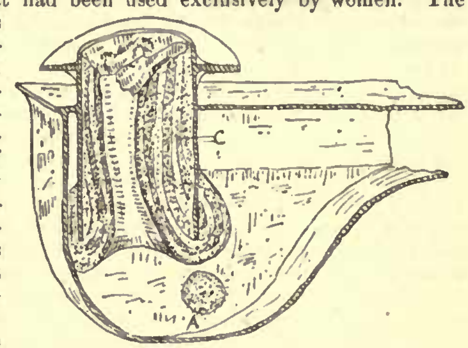


Fig. 6.—Trap used exclusively by Women.

A. Waste-Pipe.
C. Deposit.

The deposit shown in Figure 7 is much darker than in the other specimens illustrated, and its constituents are shown in Analysis No. 2. Around the inlet pipe the space is filled with a dark, spongy substance, evidently the dried-up remains of organic matter. This trap, when taken out, had been in position forty-five or fifty years.

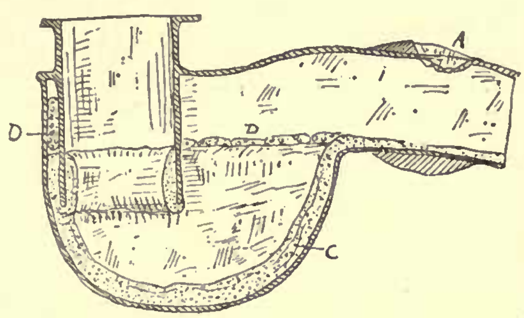


Fig. 7.—Trap fifty years old.

A. Hole made by rats. C. Deposit. D. Spongy Matter.

CHARACTER OF DEPOSITS.

[*Copy of Analyses.*]

WASHINGTON, D. C., August 22, 1885.

Sir,—The following are analyses of the deposits found in sewer-traps received at this place from London, Eng.:—

No. 1.

This specimen is of light-brown color and somewhat friable.

Water (driven off at 100° C)	per cent	11.50
Calcic phosphate	"	37.12
Plumbic Sulphate	"	1.45
Calcic carbonate	"	32.11
Volatile and organic matter (ammonic sulphide, carbon, etc.), dissipated at red heat, and loss,	"	17.82
	"	100.00

No. 2.

Specimen dark brown and very hard, pulverized with some difficulty.

Water (driven off at 100° C.)	per cent	10.81
Silica	"	10.22
Calcic carbonate	"	22.81
Alumina	"	31.24
Volatile and organic matter (ammonic sulphide, carbon, etc.), traces of lead, magnesia, sulphuric acid and chlorine,	"	17.71
Loss	"	1.21
	"	100.00

(Signed) very respectfully,
C. H. WHITE, Surgeon, U. S. N.

Whether these deposits are caused by the local chemical character of the water or excrementitious matter it is impossible to tell definitely with data at hand. As all the chemicals found in analysis

No. 1 are common in sewage, and as that is the deposit most generally found in the traps, I am inclined to think that it comes from this matter.

The position the deposit takes in the traps is marked and undeviating, with a single exception (Fig. 5), which seems to show that the matter was more or less dissolved by the water and then deposited. Although Figure 5 is an apparent exception, the specimen shows marks of a deposit in the usual place. This part of the deposit may have been broken off in taking the trap out, or in transporting it to this country. If it comes from the sewage, of course such a deposit could not occur if the sewage was all forced through the trap at the first flush, and not allowed, as is necessarily the case with traps of this form, to remain in the trap an indefinite period. All deposits are confined strictly to the water-line. Although these traps are full of rectangular corners above the water-line, as well as spaces where it would be impossible for the water to wash out filthy accumulations when the trap is flushed, still in these places there are, properly speaking, no deposits. The D-trap and others like it had been considered peculiarly faulty above the water-line, where it was generally supposed to be filled with accumulations of fæcal and other decaying organic matter. Do the specimens prove that this is not the case? I think not. Mr. E. S. Philbrick and others have found this to be the case where the trap was just removed. Such adhering matter would be nearly all organic, and would decay and pass off in its original gaseous form, any mineral substance being detached from the lead by the very process of putrefaction, thence falling into the water, where it would be deposited to remain. It does not follow, because there is no deposit in the upper part of these old traps, that there is none in a trap which is constantly being used.

From these traps it can be readily seen that no insoluble salts could be deposited in a vent-pipe upon the crown of a trap, and that a vent-pipe so placed that excrement would not choke it up temporarily would be in little danger of stoppage. A free circulation of air hastens the disintegration of all organic matter into its original gaseous constituents, when they would pass off by the open vent and soil pipes into the atmosphere, and find their proper places by the law of gaseous diffusion.

CARVING AND FURNITURE.[1] — II.


Italian Carved and Inlaid Mirror, XVIth Century.

IN my last lecture I ventured to make a few observations on the state of our present London and country houses; how small an amount of care or thought seemed to be bestowed on wood-carving in them. It seems to me a sort of necessity to employ this kind of decoration inside our houses; and that wood panelling and carved wooden door jambs, seats, bookcases, cabinets, and so forth, are not to be dispensed with if we are to make them decorative; and to be decorative in some form or other is an acknowledged necessity; even to the speculative and "jerry builder," as we see in his grotesque and vulgar cement work. Moreover, this neglect of carving is of modern growth, and we pay a tribute to our taste for the art of carving in the prices we are paying for the merest fragments of Old London. From this I went on to the consideration of those features in ordinary woodwork which are decorated by the gouge and chisel — and to reasons for this decoration. I also insisted on the pleasure which we derive from the use made of light in carving, light found and regulated by that artificial shadow or darkness created by the carver. It is the varying play of light over his masses of carving, his mouldings — large here, small there — his sharp lines of shading and other methods by which he softens off the transition from one surface of his wood-work to another; by which he rids himself of raw, poor and starved edges, or harsh angles. He makes his surfaces and his hollows die into each other, and the gradations of these interchanges vary with the increase or decrease of the light in his rooms, or outside his doorways and window openings.

To-night we are to discuss a remarkable epoch in the history of modern art, and, of course, of our own special subject. This epoch goes under the general name of the Renaissance, or *cinque cento*, — "the 16th century." Renaissance, or revival, signifies that from the time of this change the arts, as they have come down to us, went through a regular new birth; that the arts of design had died out, and that a fresh birth took place, which has resulted in a life altogether new. What was the history of their renewed life, and whence was it derived?

Well, the old architecture, sculpture, painting, enamelling, jewelry, and the arts of design in every form, in the early centuries of our era, grew up under the protection of the Roman power. That great empire, the strongest and the widest which the world has seen, embraced all central Europe, and all the countries that border the Mediterranean Sea. The Greeks, who had been the most gifted artists in the world, had become Roman subjects; their temples at Athens and Olympia were standing untouched and perfect; with their statues of bronze and marble, and ivory and gold. Delphi, with three thousand statues; and treasuries in the shrines and temples of other famous places were crammed with busts, little statuettes, medallions, heads cut in precious materials, sculptured crystals and gems, costly jewels of rare workmanship, every sort of precious offering. Corinth was a city of refinement and pleasure; Athens the university of the world. All these splendors the Roman emperors and patricians imitated; and much they imported into Rome. Excellent Greek artists and workmen were attracted by the high wages to be had in the capital. Countless copies were made of the old masters, masterpieces of Pheidias, Praxiteles and others, whose original works were still in perfect condition. These copies represented the old art which passes with us under the name of Classic.

This splendor was not confined to Rome or to Greece. Alexandria was another capital of the empire, and a general seat of literature and learning. After a time Constantinople became even more specially a capital, the first for wealth, rank and political importance. A new empire gradually rose there, seated on the confines of Europe and of Asia. Antioch, too, was the capital of the luxurious, idle and pleasure-seeking among the Romans.

Besides these great cities, Cologne, Paris, Treves, London, and many other important places grew up into capital towns; the Roman civilization which spread over Asia Minor and Italy made its mark on these provincial centres. Gaul, Spain, England, became in their turn Roman provinces. Civil and military governors came thither, built temples and towns, fortified the principal cities, established courts, opened markets for the country people. Handsome houses, or, as they called them, villas, with painted walls, tessellated pavements, hot-air furnaces, all that belongs to material comfort and enjoyment, were to be met with, not in London only, nor in such towns as Silchester, where you can see traces of all these details, but on sunny lawns and slopes of the New Forest, and many other choice spots on the Hampshire and Sussex coast, and in all sorts of places that command agreeable views and healthy sea air.

We know something of the general character of this old domestic art from what has been unearthed at Pompeii. That town, a small Brighton or Margate of the Romans, on the slopes of Mount Vesuvius, then a grass-grown hill such as we see in small on our downs, was overwhelmed by an unlooked-for calamity. Vesuvius suddenly burst out in showers of ashes, so fine, so dense in compression, and so continuous, that the entire town was buried many feet deep with them. The inhabitants could not all escape, and some were stifled by the sulphureous gases of the eruption. To this calamity we owe most of our knowledge of Roman life in its more minute daily details, for the whole town has been sealed up for our instruction, and in modern times it has just been unburied, and all such furniture and utensils as were of metal, and not perishable, have been recovered.

Now, this antique art, less and less exact and refined, prevailed wherever the Roman name was respected for the first five centuries of our era. Imagine London in the year 400, and you would have found a sort of little Rome. Our countrymen, when we find them in the colonies, can show us something like a slice of the old country. It was the same when we ourselves were a distant offshoot of the great Roman growth. A Roman officer in London would have invited us into a house built like a small cloister, with a garden in the middle. If large, these cloisters would have looked into it through windows which could be closed with hangings or shutters. If small, the centre part would have been closed over in winter with a movable wooden roof, in which we should see little panes of transparent talc, or of glass, which had been made here in London under the guidance of a workman from the islands of the Adriatic. Cornices of moulded glass of beautiful colors would set off the coffers and divisions of the permanent ceiling of his cloisters. Family pictures, in folding frames, carved in wood and gilt, would be set on narrow wooden shelves, against the wall. Busts of famous personages, his ancestors perhaps, on terminal posts of white marble, would stand at intervals along the wall, or on either side of the openings into the centre garden. The lady of the house would be seated in a chair of wood resembling our ordinary dining-room chair. She would offer her guests long couches framed in fine chased and gilt bronze laid over wood, bedded with thongs of leather, over which would be laid cushions covered with Syrian embroideries. Other seats of similar bronze work would be decorated with the heads of horses, birds, or

[1] A lecture by J. Hungerford Pollen, delivered before the Society of Arts, and printed in the *Journal* of the Society. Continued from Page 112, No. 506.

other animals, and inlaid with damascene work of the precious metals. These would have been brought with them from Rome. A chair heavily framed, with back and arms, panelled with carved ivory, would be pointed to as a family relic, the chair of a senator of past times, such as the chair of St. Peter in Rome. Another, with solid ivory frame, carved and gilt, jointed like two X's, but curved, as being made of two fine elephant tusks sawed through the middle, would be the curule chair of the master of the house, folded up and carried with him in his carriage, when he went to preside in court, and at other ceremonies. Other bronze seats without backs, but of double height, would be carried after the ladies when they went to any public entertainment, along with a wide footstool. On this she could see over the heads of the crowd. The palanquin, in which ladies of rank went abroad, would have a frame of sandal-wood richly carved, or of ebony inlaid with dies of ivory and metal-work, recently imported from India. This would be shut in with sliding lattices, and well-furnished with rich curtains and cushions. It would have a long pole of oak, neatly carved by native workmen, and long enough for three bearers in front and three behind, to rest it on their shoulders, sometimes their heads.

In this way our countrymen, great bronze workers and enamellers from immemorial time, learned to add to these accomplishments such training in sculpture, architecture, and the sumptuary arts, as Roman colonists could impart.

But as to our special subject, wood-carving, and in particular, the wood-carving of the Renaissance, it must be admitted that classic art gives us but meagre notions. The furniture, the figure-heads of ships, the fronts of chariots, were generally covered with bronze, sometimes cast in solid masses, sometimes thin, strengthened by a core of wood. It was chased with the graver, and generally of the color of dull gold often gilt.

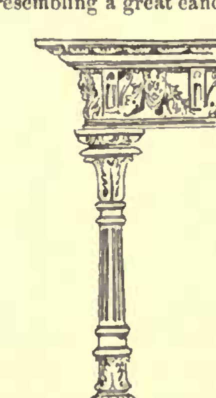
The Renaissance artists had before them bronze and marble sculpture and marble architecture. The great temples, palaces, arches, altars and other architectural monuments, disfigured and damaged, were yet sufficiently preserved to excite the admiration, and fire the enthusiasm of the Italians of the fifteenth and sixteenth centuries.

Meanwhile, that art which we have called Classic, and in its debased state first Byzantine or Constantinopolitan, then Romanesque or Norman, as we see in the churches of the Rhine, and in the Bayeux tapestry — this art, these antique fashions, had gradually died out, and given place to fashions in which wood-carving played a conspicuous part. London, and other cities of the thirteenth, fourteenth and fifteenth centuries, were constructed mainly of timber-houses; and extraordinary skill and ingenuity are seen in what remains of those structures and their ornamentation. London bridge was covered with houses, some made, carved and prepared in Holland—Nonsuch-house, for instance — and fitted together on the bridge. The streets were narrow, the houses framed of great beams and uprights of native oak. Along the beams, legends were carved in Gothic letters; up the angles were shallow niches, with statues of favorite saints, and over each a pierced and carved canopy. The stories of the house projected till the top ones approached each other in the narrow streets from side to side. Inside, the walls were panelled; the ceiling, beams and timbers had moulded edges, ending in grotesque animals. The doors were carved on the jambs and the spandrels of the arched heads. The gables were fringed with barge-boards carved on the edges.

Fine examples of the carving of those centuries are still to be seen in the stall work of cathedrals and minsters. I pointed out some last week — Winchester Cathedral, for instance — belonging to the very central period of what we will call the Pointed Style. Other examples belonged to a much later time. The stalls of Henry VII's Chapel at Westminster were carved when the old style was dying out. The actual tomb of that king, ordered by himself of the Italian sculptor, Torrigiano, belongs to the Renaissance. Yet, as examples of wood-carving, I do not know where to look for anything more skilfully executed, or more bold and racy in conception and graceful in arrangement. So, again, in such large structures as the roof of Westminster hall, with flying angels sculptured under the principal upright timbers. They are light, they float overhead, yet they are really masses of timber all well tied and fitted into the general structure. Such was the wood-work which the Renaissance found in possession. It took but limited notice of this grand structural timber art; and for what was so inventive and so dramatic in this old mixture of structural and decorative work, it substituted other kinds of excellence. I said just now that the art of the revived time was specially connected with the date of its revival — the sixteenth century, that is, from 1500 to 1600. Italians spoke of the time as the *cinque cento*, five hundred; but they also speak of the change in its earlier phases as the *quattro cento*, the four or fourteen hundred — the century between 1400 and 1500. The architecture, sculpture and painting, dating between 1430 and 1500 or thereabouts, is of peculiar beauty. There is a grace and tenderness about it which did not survive the bolder, fuller, and more scientific advance which was made in the *cinque cento* or 1500 century. In studying the art, the wood-carver's art among others, we should keep this distinction before us. When Michael Angelo and a host of pupils pushed their studies of old Roman art in all directions, statues, busts, fragments of old sculpture of all kinds, were continually being disinterred. Rome was half rebuilt, and numbers of these relics came to light in the process. It was a revival, a literal unburial of the old classic traditions of Rome.

This revival was very differently carried out in Italy, and in the northern countries. Gothic, or pointed architecture, never prevailed in the south to the degree it did in the north. Old basilicas, following the shape of the great halls of justice of the Romans, were very different from our northern minsters; old ruined temples, arches and columns, met the eye all over Italy, such as were never equalled by the provincial builders of Gaul or Spain, or England, and our great churches, castles and manor-houses, put entirely out of sight any antique buildings, if indeed, any such remained among us. In the North, therefore, there remained only the great imposing structures founded by religious bodies, or by kings and princes, and all in the Pointed style. The Renaissance art, both in building and in carving, in England, France, and other distant lands, retained a great deal of these mediæval traditions. In these countries, it produced that mixed style so picturesque, and so well suited to the feudal spirits of the North, which we call Elizabethan, or "*François premier*," such as you see in our noble old mansions in England; at Blois and Chambord, and a hundred other places in France; in the great Flemish cities; in Germany, and other countries.

The Classic art in architecture, wood-work and furniture is as complete as modern European habits will admit in Italy. The broad outlines of wood structure and decoration of this kind are borrowed from architecture, and almost all the decoration consists in the carvings on columns and pilasters; on different members of framework such as bases, cornices, edges of all kinds; in the coffers or hollows of roofs and ceilings; and on the various parts which make up chests and cabinets. Let us take these in order. Columns, if on a large scale, such as the screens between the divisions of churches and halls, are generally cut into flutings. These grooves break up the heavy surface of the column, and make an agreeable play of light and shadow round it. The lower ends are sometimes filled with carved decoration in shallow relief. In smaller columns, those that support pieces of fixed furniture, such as bookcases, the entire surface is often carved with fine arabesques. Pilasters, the commoner form of wooden upright members, are, as you know, representatives or types of piers embedded, and are faced with narrow panels which are cut into their surfaces. These we fill with what are called arabesques, a series of leaves, branches, sometimes little figures of genii or fairies running in and out, with birds, animals, anything which the carver's knowledge suggests to him. All these should be composed as though they grew easily out of a bold stem, with neckings and projections resembling a great candlestick or candelabrum. Of such composition there are hundreds, some in marble or stone, some in wood in the Kensington Museum. Any series of engravings of old monuments in Italy will contain an endless variety. There are a set of painted arabesques decorations of this kind in the Vatican, in one of the galleries that run along one of the sides of that palace. They are known by the name of Raphael, the painter who painted, them with the help of his pupils.



Bed-Post, Time of Francis I, from the Musee de Cluny.

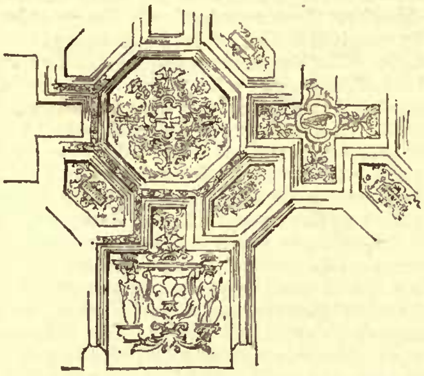
If we look at Renaissance panelling on



Italian Arabesque, XVI Century.

a large scale, the old bedrooms for instance, of the Louvre, the panels are divided into a base — or dado — on which the uprights rest as

though it were the base of an external front. Then the body of the wall, sometimes in a series of small panels, sometimes in narrow and tall ones. Then a frieze, or border along the top, finally cornices which carry the eye up to the ceiling. It is on the base, and on the frieze that carved masses, or continuous rolling scrolls with figures among them, find their place. These are carvings, which not being simple repetitions such as would occur on mouldings, but artistic compositions, call out the best skill of the carver. Then comes the roof or ceiling of the room. This has to be treated, in the first place, with reference to the structure. Suppose it is a roof, as of a hall or church, with nothing above it. We have the structural roof such as we see at Westminster, and such as I will illustrate by reference to old English houses. If carved we could only carve the larger posts, and this is often finely done; but we do not meet these roofs in Italian structure, we generally meet with carved flat ceilings. In many old rooms in Venice and other cities, the joists and timbers are shown, and are painted and gilt. In other cases these joists are ceiled over with panelling — the panels decorated with various kinds of cut mouldings — and the panel itself fitted with carved foliage, sometimes radiating foliage. I have some photographs of such a panelled roof in Milan, the panels having been moved, I believe, from a house in Brescia. Such carving as this is made in the workshop and fastened into its place. The leaves in this instance are flat, like those of flags, so as to look as light and to reflect light as much as such slight carving could.

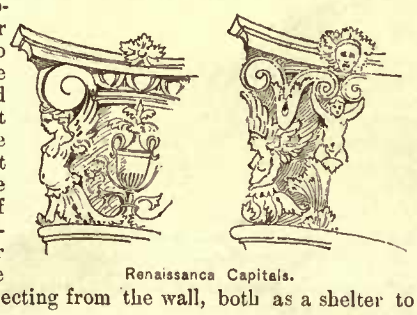

Ceiling from the Chapel Royal, St. James's Palace, London. Painted by Holbein.

The finest treatment of a ceiling showing the timbers, of which I can speak, is one I saw a few weeks since in Cairo. The larger timbers rest on carved brackets cusped down to the walls. The under sides are rounded, except in the middle and at the ends. Enough of the original square surface is there preserved to form a circular disc, with two half discs at the ends. These three are filled with well-treated arabesque carving of Persian design. The smaller joists are moulded with a torus and an arris, and kept square on the ends. These ends are also cut in arabesques. For valuable effect got by the simplest arrangement, I have never met with any ceiling so satisfactory. This is Arab art, it is true; but it has a close alliance with the Italian arabesque carving we have been discussing. Another way of treating a ceiling is to subdivide it by moulded bars or stiles, with carvings of a simple kind at the intersections.

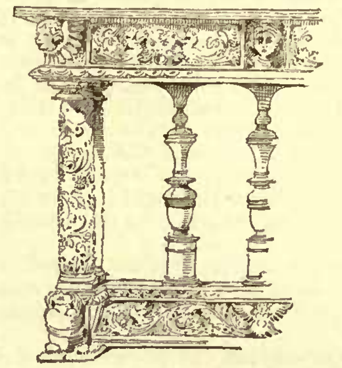

German Carved-Wood Panel, XVI Century.

How seldom do we see any attempt at a carved ceiling in any of our modern houses! How seldom! Do we see it ever? Would the London house be so much more costly if the principal room or rooms had ceilings carved in pine wood? Would the cost exceed that of the usual ceiling—sometimes neatly decorated in plaster, gilt and painted, and of which the painting or the whitewash must be renewed from time to time. Sheet it over with pine, subdivide it, put into panels carving to the value of some great ball or entertainment, such as perhaps is given every London season. As to cost, our public offices contain rooms on which cost has not been grudged. What part of any room is more effective than its ceiling? What part of the room, as a general rule, is so dull as the ceilings of the best rooms of the day?

As to the important subject of mouldings, I will presently show a complete set, as they are technically known in Vitruvian architecture. These form the borders of buildings, of cabinets, of rooms, and are known by various names. The upper mouldings curve forward, and suggest the idea of an eave or protection from rain. The lower have their convex surfaces uppermost, and spread out their bases to suggest the idea of support. The sharp lines or curves that are added to the *cyma recta* and the *cyma reversa* separate and give emphasis and effect to those members. The square bar or beam that occurs in the middle of the upper and lower set of mouldings, when mouldings are grouped together as in cornices, suggests the idea of a beam or bar projecting from the wall, both as a shelter to the house and a support to the upper surface, whether wall and roof or ceiling; and where cornices are on a large scale this central beam is supported by bracket-shaped mouldings, such as egg and anchor, or rows of dentils, or a row of small brackets. It is important to know and observe the connection and order of these parts with reference to each other, so that the original type may never be wholly lost.


Renaissance Capitals.

As to leaf-work, such as that which forms the capital of the column, the rolling scrolls on friezes, etc., generally it is one and the same leaf, the acanthus. Many natural leaves, used conventionally, are found in mediæval carving. But in that of the Renaissance, if we except the occasional use of sprays of olive, and those conventional heart-shaped leaves on carved mouldings, there is but one leaf found in what may be called regular harness; and that is the acanthus. It is the thistle, but treated altogether conventionally. The utmost skill is shown in the direction given to the stem, the pipings or creases in the leaf, the number and arrangement of the notchings on the edge. If you examine the capitals of the Roman temples, those of the Renaissance period in Italy, or those in northern countries, while the variety is endless, there is no mistaking the acanthus of any of them for any other leaf. So also where the leaf is broken up and used in fragments, as on mouldings and as offsets to lines, and stems such as are met with in furniture, mirror frames and the like. A good deal of fine carving is sometimes made up of figure work and acanthus. Corners of chests and cabinets, brackets, also friezes of furniture and panelling, are made up of what are called grotesques, that is, human figures half-formed and merging into leaf-work, or into the bodies of animals. There are abundant examples in the Kensington Museum. If one speaks of figure carving, without doubt, a man or an animal completely formed is a more worthy object for the chisel than such a mixture, but it is not always so bold or so decorative when used in cabinets and chests, or on ornamental friezes. In such uses figures are subordinate and are used in a grotesque form so as to make the room or the chest both decorative and interesting when seen as a whole.

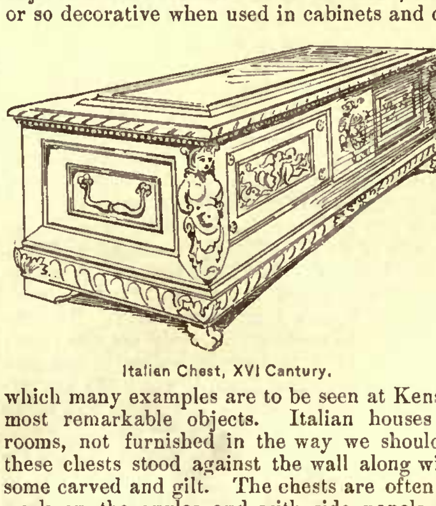

French Table, XVI Century.

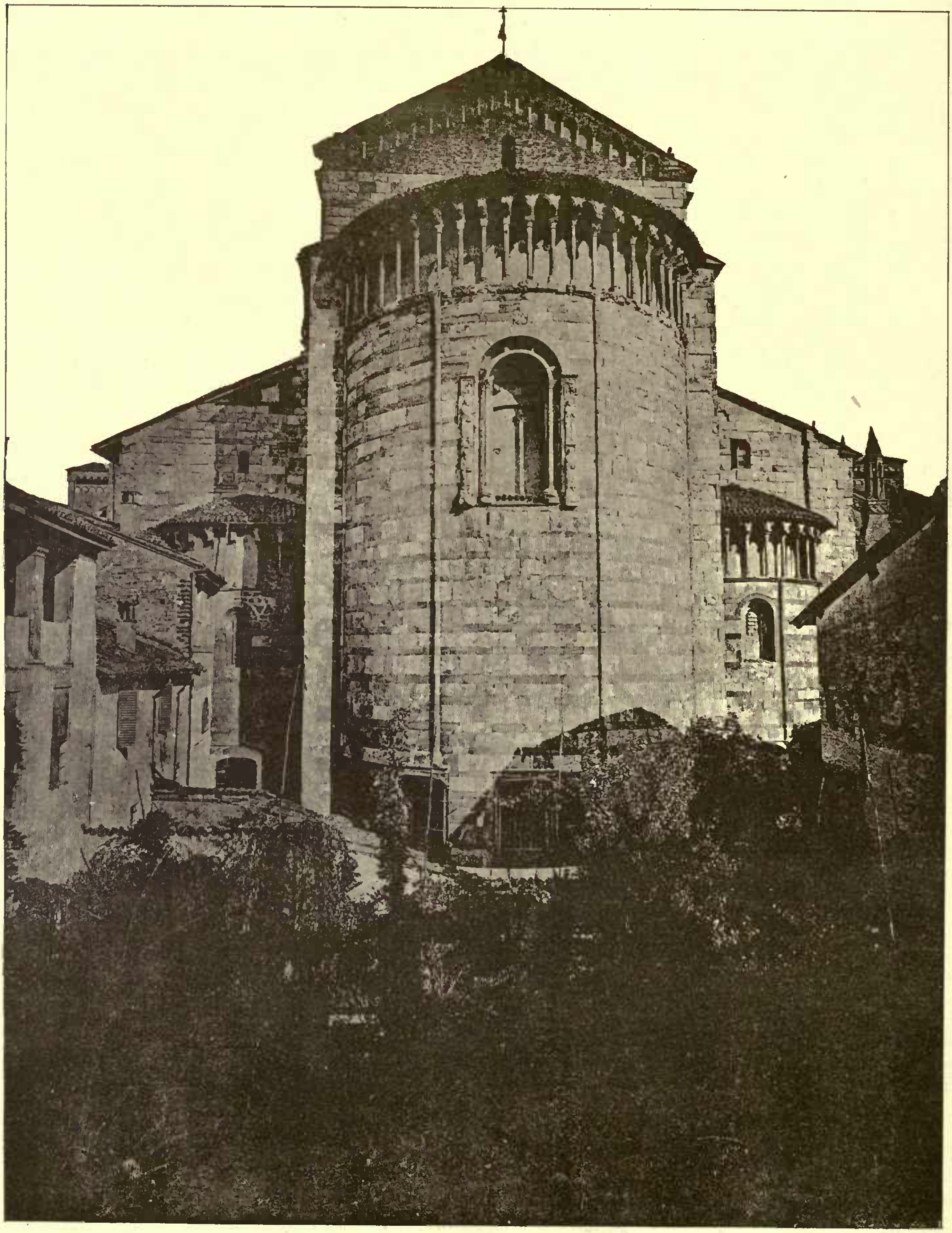

Carved Italian Chest, XVI Century.


Carved-Wood Panel, Italian, XVI Century.

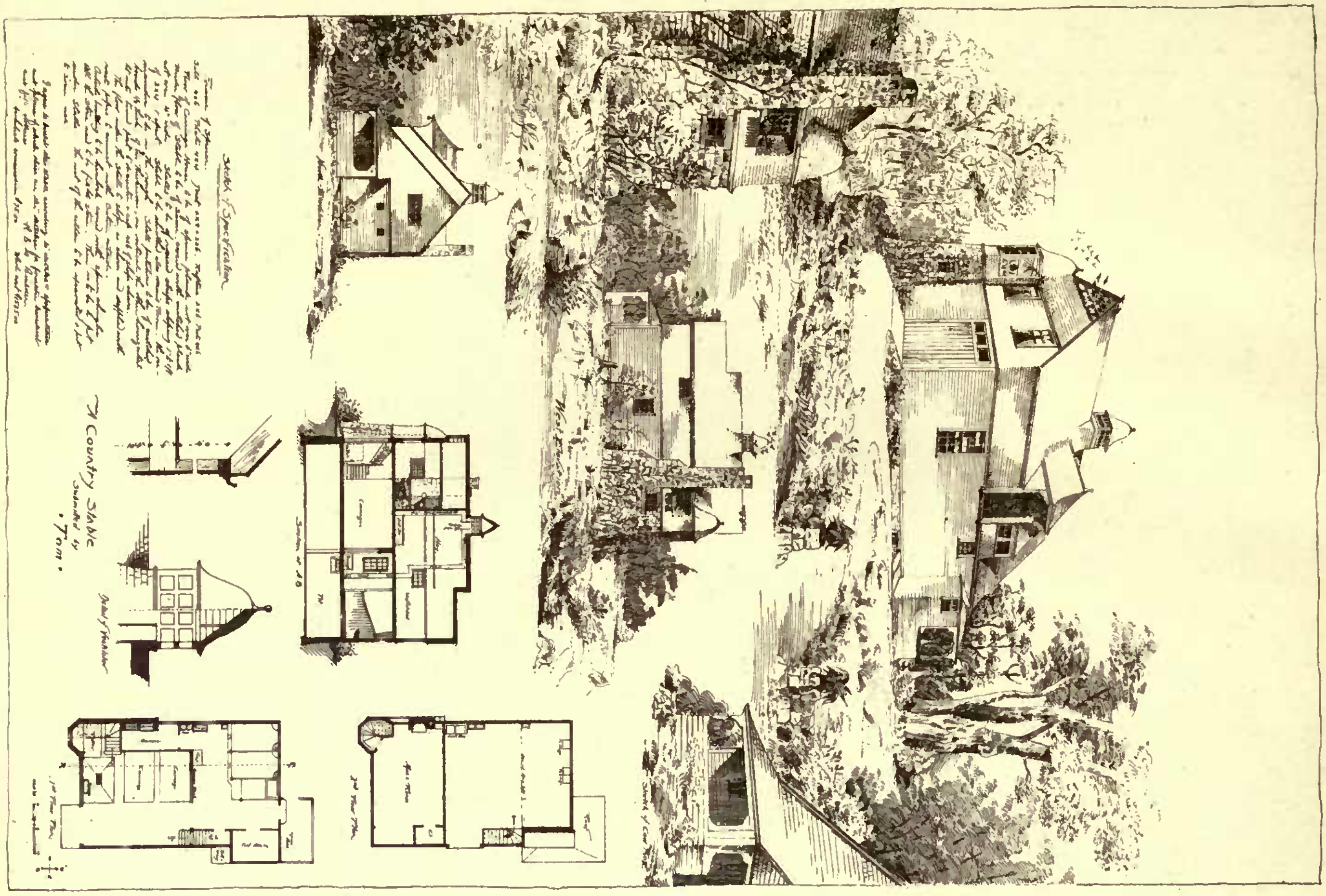
I have already spoken of the composition of panels of carved work, and will show a few examples.

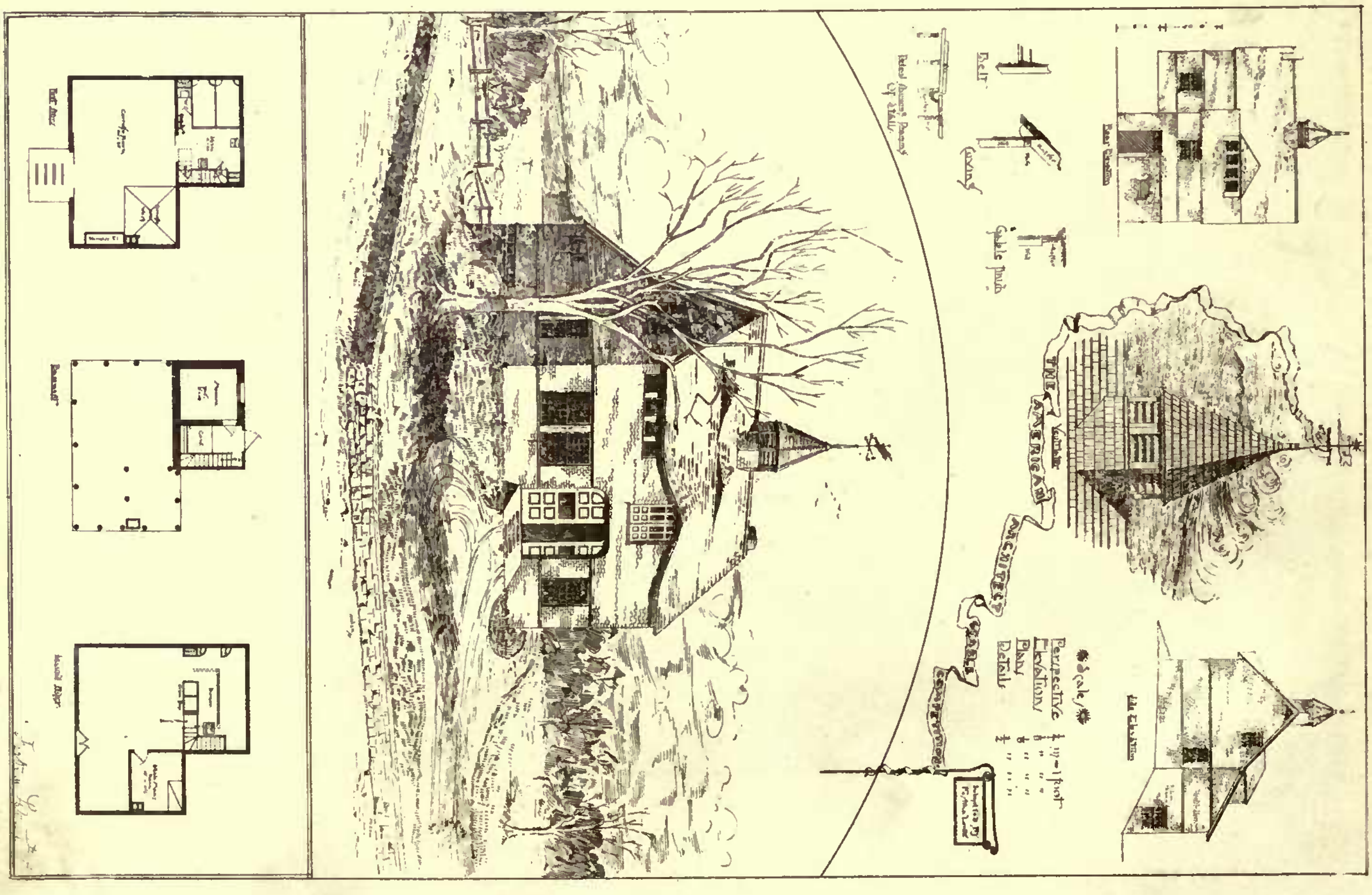
As to the furniture of the sixteenth century, the chests, of which many examples are to be seen at Kensington, are amongst the most remarkable objects. Italian houses have large and stately rooms, not furnished in the way we should call comfortable; and these chests stood against the wall along with chairs, some carved, some carved and gilt. The chests are often carved with bold figure work on the angles, and with side panels containing mythological subjects, or subjects drawn from the works of Latin poets. The libraries contained cases carved, inlaid and mounted with gilt metal work. Vasari, and other writers, give descriptions of astonishing


Italian Chest, XVI Century.

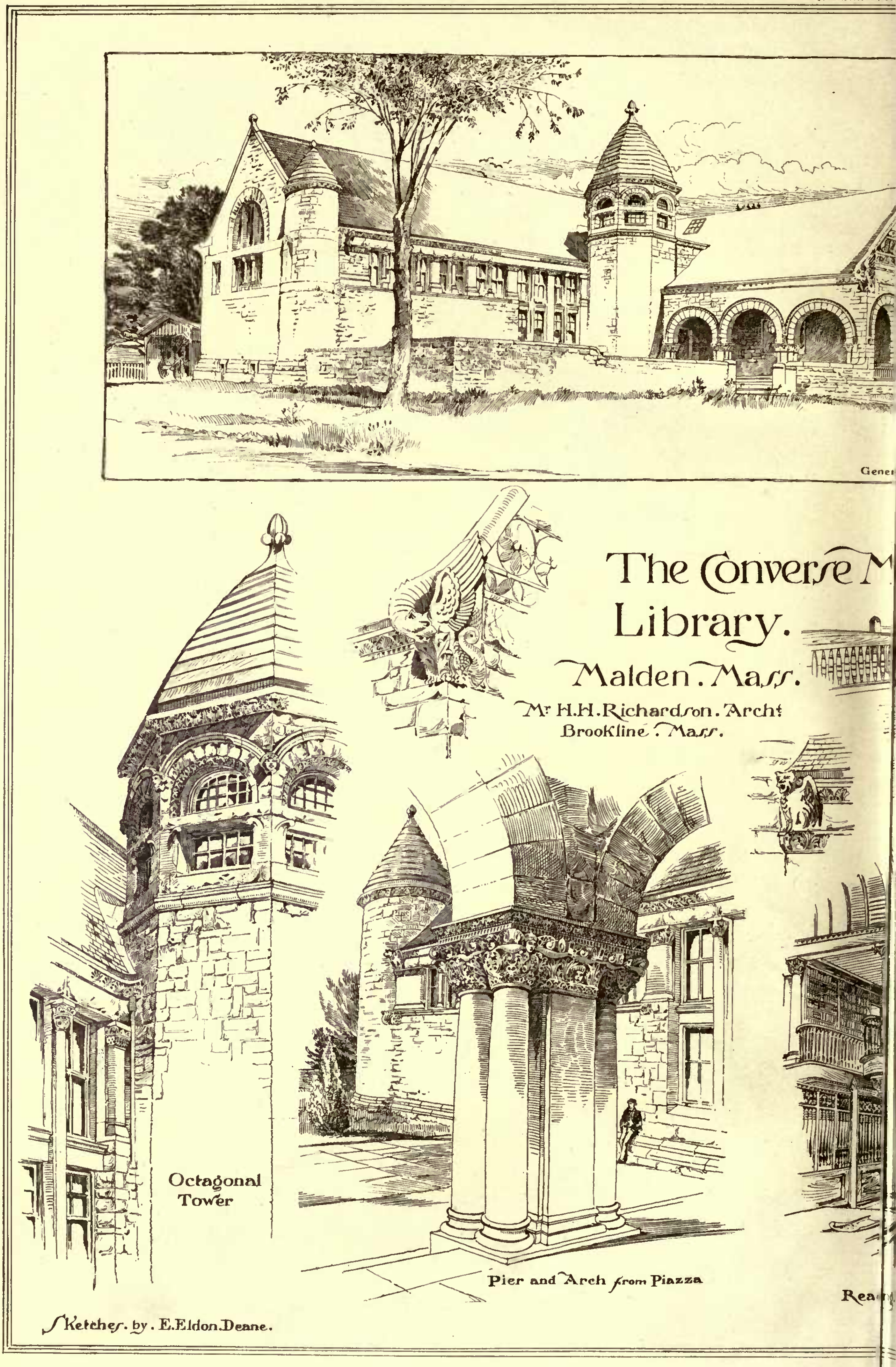


Apse of the Cathedral, Piacenza, Italy.



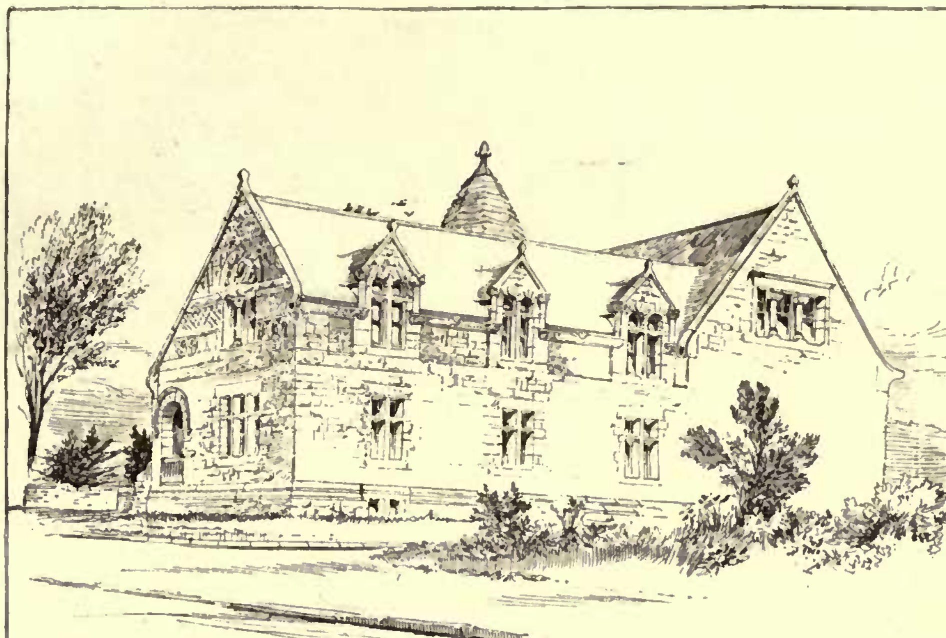


HELIOTYPE PRINTING CO. BOSTON


The Converse
Library.
Malden. Mass.
Mr H.H.Richardson. Archt
Brookline. Mass.
Octagonal Tower
Pier and Arch from Piazza
Sketches. by. E.Eldon.Deane.



View.

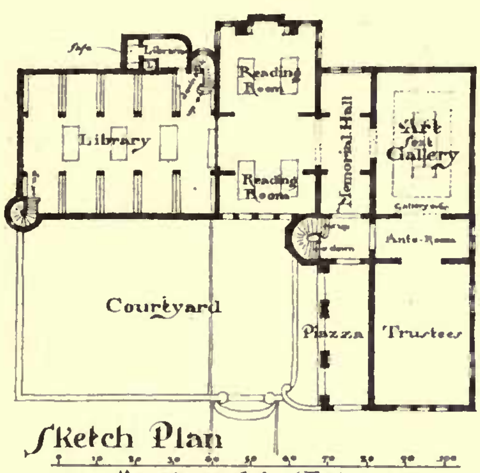


Reverse side of Wing

...emorial

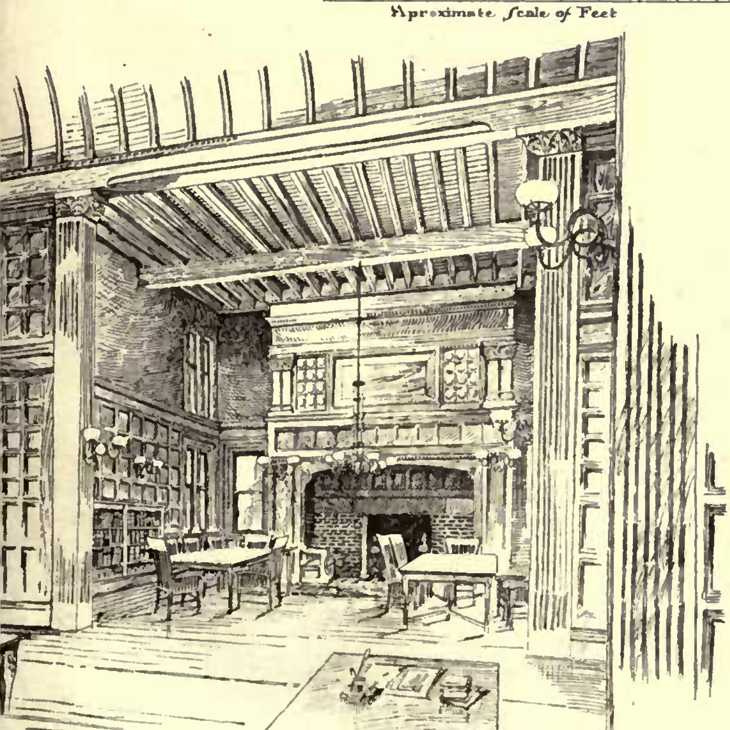


Seat in Art Gallery

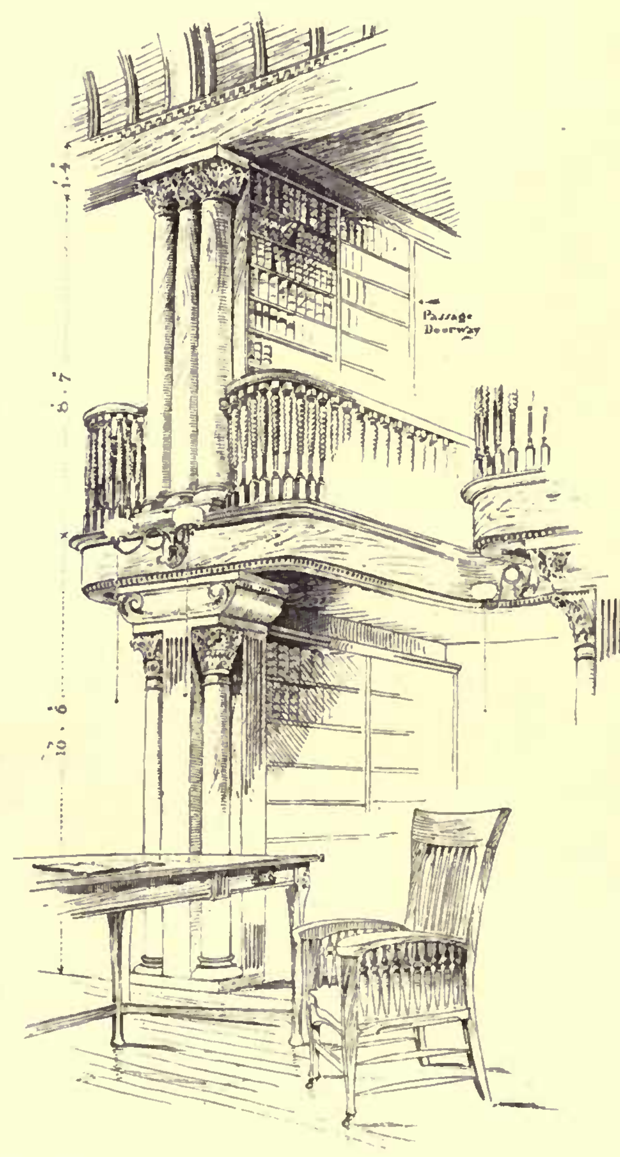


Sketch Plan

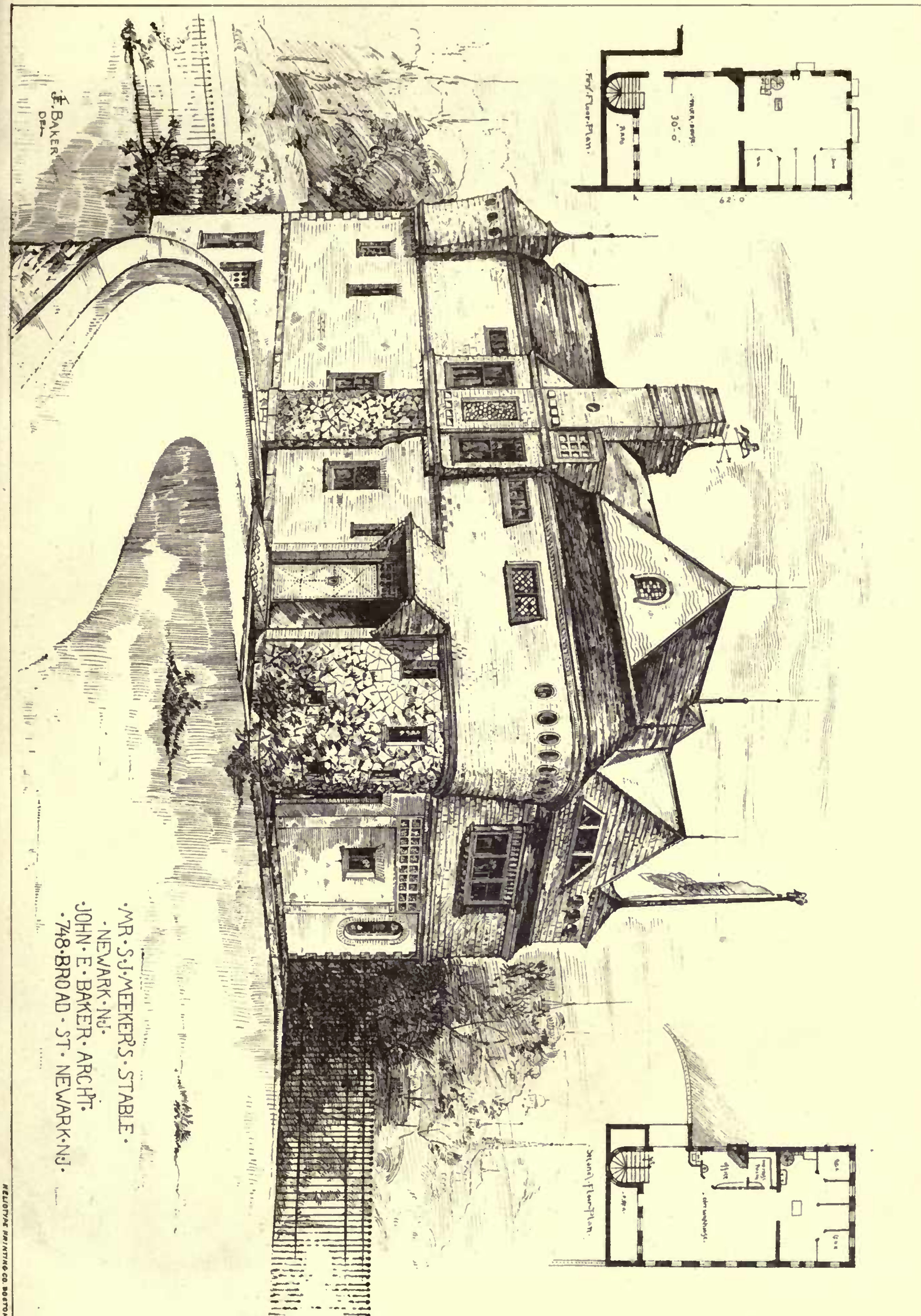
Aproximate Scale of Feet



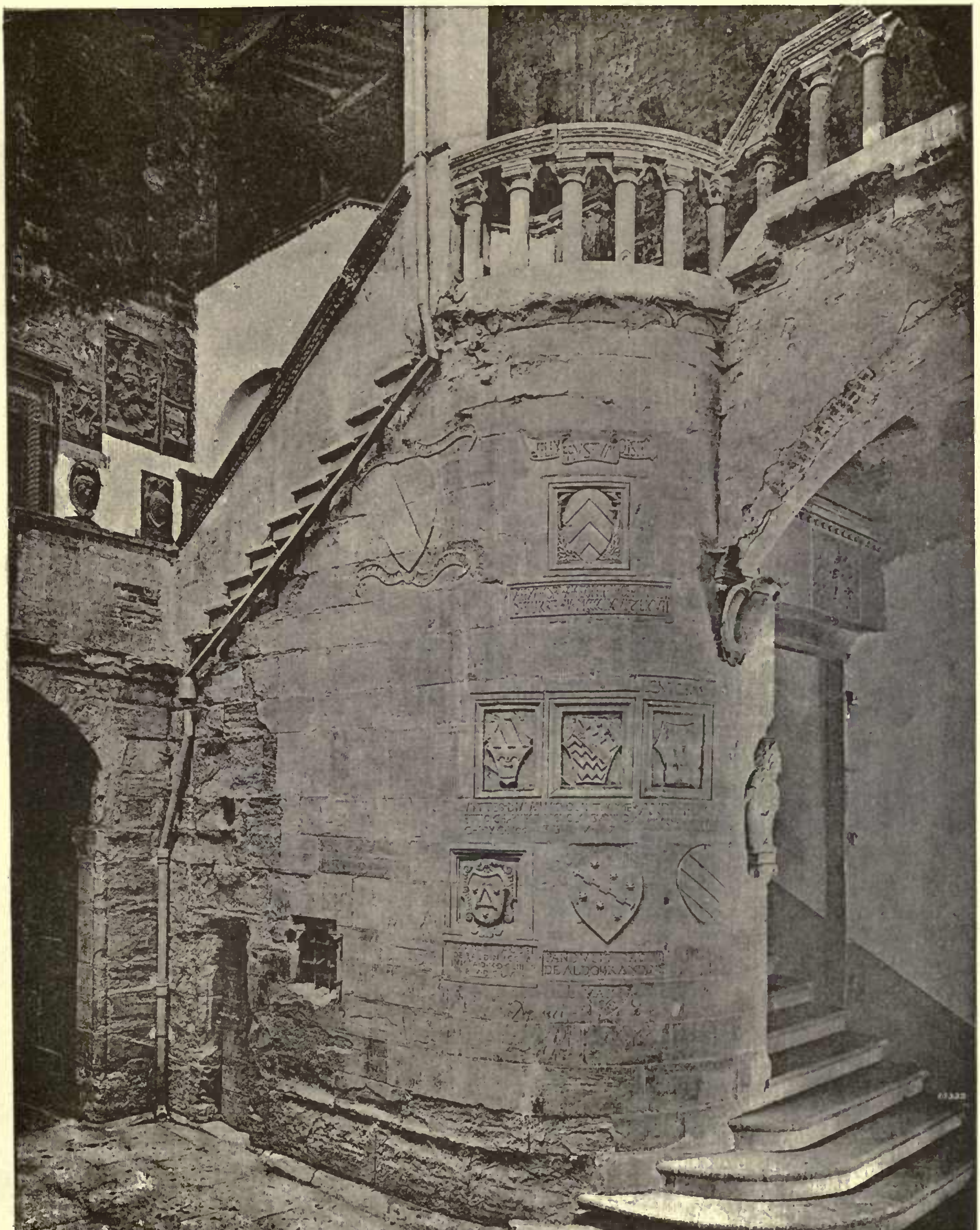
Room.



Alcoves with Book-stacks in Library



J.E. BAKER DEL
First Floor Plan
30'-0"
62'-0"
Second Floor Plan
·MR·S.J.MEEKER'S·STABLE·
·NEWARK·N.J·
·JOHN·E·BAKER·ARCH'T·
·748·BROAD·ST·NEWARK·N.J·



Staircase in the Palazzo dei Conti Guidi, Casentino, Italy.

objects of this kind made for the Medici family. Smaller objects, such as mirrors, bellows, distaffs, walking sticks, may be seen with excellent carving all over them, in the Kensington Museum. Some of these have been reproduced in the School of Carving, and were shown in the Health Exhibition last year.



Italian Bellows, XVI Century.

Two special accomplishments seem to be required, if we desire to design such carving as Renaissance decoration requires. One is that of modelling the figures, the other, some acquaintance with the common decorative details of Renaissance architecture. Most museums contain examples of the sarcophagus fronts which were made in the second and third century. The details of their ornamentation, apart from such figure compositions as are often sculptured on them, were the sources from which *cinque cento* furniture makers drew much of their decoration. Generally, also, it must be said, that though learning, properly so-called, is never common, yet the artists of those days and their workmen knew something of the literature of classic authors. Princes, prelates, merchants and warriors were full of enthusiasm for the arts and the poetry of ancient Rome. A general knowledge may be said to have been in the air; pupils got it from their masters. Great men threw open their houses and gardens, invited young sculptors to come and study there, overlooked their work, explained the meaning of actions or the mythology of personages represented in the fragments of statues or the bas-reliefs found on the soil. Enthusiastic artists copied and reproduced marbles, medals and gems so abundantly and so well that they passed for genuine, and even now known forgeries of those days are valued for the excellence of their design and workmanship. It is this sort of enthusiasm which produces a cultivated taste, and makes an artist and a poet of the workman.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE CONVERSE MEMORIAL LIBRARY, MALDEN, MASS. H. H. RICHARDSON, ARCHITECT, BROOKLINE, MASS.

THE Boston *Herald* gives the following description of this building: The new Converse Memorial Library building on the corner of Salem and Park Streets in Malden, which has recently been erected by Hon. Elisha S. Converse, and his wife, Mary D. Converse, in memory of their son, who died nearly a score of years ago.

The main building is forty-one feet and six inches from the top of the basement to the ridge of the roof. At the junction of the arms an octagonal tower ascends fifty-five feet to the finish. The walls are laid in ashlar work of brown sandstone, quarried at Longmeadow, with trimmings of the same material, while the gable on Salem Street is broken by mosaic work in sandstone, artistically finished in three colors. The court-yard, which is on the easterly and southerly sides of the building, is inclosed on those sides by a wall of Kibbe stone, forty-two inches in height, and has been laid out as a lawn, with the exception of the easterly portion, which is paved with bluestone. Access is gained to the library building from Salem Street, over the lawn to the court, and, by a rise of four steps, to a cloister or porch, the three arches of which form a distinguishing feature of the exterior of the building. At the opposite end is the vestibule, leading into the Memorial Hall, extending across the building and separating the delivery and library rooms from the art gallery. The porch measures 10′ x 36′, in the wall of which is a large memorial tablet suitably inscribed. Passing from the porch through massive glass-studded doors, the vestibule is reached, directly in front of which is a wide entrance leading into Memorial Hall, which constitutes a portion of the library room, its dimensions measuring 13′ by 37′. It is wainscotted in oak panels, the walls are of rough sand finish, colored in Pompeiian green and ochre, the woodwork being finished in a darker hue than any other room. Turning to the left and passing through an arch extending the entire height of the building, entrance is gained into the delivery room, measuring twenty-five feet square, a broad counter separating this room from the reading room, the latter containing the alcoves for the books and periodicals. At the west end of the room is an elaborate fire-place, covering the entire wall. These rooms have barrel ceilings, and are finished in quartered white oak, enriched by mouldings and carved work. From the floor to the spring of the arch is twenty-one feet, and to extreme height of the soffit twenty-nine feet six inches. The galleries containing the alcoves are on both sides of the library room, to which access is had by winding staircases in each corner, the one on the south side being enclosed in the small round tower which forms the southwestern corner of the building.

The main room devoted to the library occupies the larger part of the south wing and measures 36′ x 50′. It is lighted by a large window in the western gable, by window openings in the sides above the galleries and by dormers in the roof. The interior finish is of white oak, highly polishedand elaborately carved. The ceiling is vaulted, of the style known as barrel roof, made of narrow beaded oak strips with moulded oak ribs. There are ten clusters of fluted columns, supporting a gallery extending around the three sides of a room, the columns of which form alcoves for the books and magazines. As at present designed, the alcoves contain space for over 35,000 volumes, which may be easily increased by additional alcoves without crowding or injury to the architectural featnres of the room, to a capacity of nearly 60,000 volumes. The shelves are supported on brass rods of the latest and most improved pattern. Especial pains have been taken in the finish of the room, and it is pronounced by competent judges to be the finest of the kind in the State. On the right of the delivery room, and in the rear of the building, is a convenient librarian's room, containing a fireproof vault for the security of papers and other valuable matter.

The art gallery is divided by an arch from Memorial Hall, in the northeast corner of the building, the room measuring 24′ x 36′, the walls of which are tinted in a delicate gray. It is lighted from the roof by means of a large skylight of hammered glass, with the most modern appliances for regulating the light to the best advantage. Beyond the art gallery is an anteroom, which can be used for engravings or statuary, entrance to which is gained from the vestibule. Farther on is the room designed for the use of the trustees, which is one of the handsomest rooms in the building, measuring 24′ x 37′. It is lighted by three large double windows, and its walls are of a rich yellow, with a broad freize of red. All the rooms upon this floor are connected by arched openings, which may be closed by curtains or sliding doors, and, when occasion requires, the whole space can be thrown into one. At the left of the vestibule is a winding stairway which leads to the rooms which will probably be occupied by the Middlesex Society, immediately above the trustees' room. In style of finish this room compares favorably with the rest of the building, its walls being of a red and yellowish tint, and the floor of polished hard pine. On the east side of the room is a gallery with handsomely carved railings, from which an unobstructed view can be had of the art gallery.

There are in the building nearly 7000 square feet of space, exclusive of the basement rooms. The cellars extend under the entire structure, and contain the boilers for heating purposes, convenient toilet and storage rooms, etc. That part directly beneath the library room has been arranged for a general work room, where the labor of receiving and preparing books and pamphlets for the shelves is performed. It is over nine feet in height, well lighted and ventilated, and is thoroughly protected from dampness with carefully prepared cemented floors. Should occasion require, it can be made to afford safe accommodation for over 20,000 volumes.

PORTRAITS IN BRUMIDI'S FRESCOES IN THE ROTUNDA AT WASHINGTON.

Two of the cherubim on the frescoed walls of one of the Senate committee rooms at the Capitol have the faces of Jeff Davis's two children. At the time this frescoing was done Mr. Davis was Secretary of War. Mrs. Davis gave Captain, now General Meigs, who was then in charge of the Capitol, the pictures of the children, and asked him to have Brumidi use them to paint from. The artist objected that they were not beautiful enough for the purpose, when the pictures were first handed him, but on being pressed shrugged his shoulders and went to work. Gen. Meigs's son, a pretty, golden-haired boy, does duty as a cherub, also, in company with a little girl, the daughter of Mr. Walter, at one time architect of the Capitol. It is said that the face of Jeff Davis himself appears conspicuously in the frescoing in the canopy above the rotunda, but in a character not complimentary. Brumidi always claimed, however, that the likeness was not intentional. In this great allegorical piece five figures representing Discord are being driven from the scene by the angry goddess. One of these figures, whether by accident or intent, has the face of Davis, and the others are considered fair likenesses of Gen. Robert E. Lee, Stonewall Jackson, Alexander Stephens and Calhoun. Architect Clark thinks these likenesses are purely accidental, or the resemblances are only fancied. The one of Gen. Lee, for instance, he said to a *Star* reporter, was put there when Lee was remembered as a dapper man with no beard. Yet it was a very fair likeness of the bearded man who surrendered to Grant. Brumidi had no means of knowing that he had let his beard grow. Two likenesses that are known to have been put into this grand allegory intentionally are those of Mr. Walter, the architect, and Robert Morris, the great Secretary of the Treasury. Mr. Morris is the figure representing the merchant. Brumidi first placed the head of Gen. Meigs upon this figure, but that gentleman requested that it be taken out, much against the wishes of the artist, who wanted to do this honor to his kind patron. He finally agreed, however, to substitute the head of Robert Morris, who was considered to have done more than any other man of his day for the commerce of his country. The figures of Franklin, Morse and Fulton were used to personify science and invention, and it is not unlikely that the artist, casting about for Discord in about the year 1863 should strike upon the great secessionists

and that the likenesses in that case are as real as in the others. Certainly the artist was a little bold in his allegory, for in another piece of work, done a little later, he represents a winged messenger placing in the hands of the goddess a pair of reins to which is attached a curb bit, while a much milder-looking messenger is handing her the palms of victory on the other side. Thus it is delicately suggested that the victor should hold a tight rein over and curb the vanquished. Throughout the Senate wing there has been much more labor expended in the way of frescoing than on the House side, but there are many vacant panels, which were intended to contain faces. In the lower corridor these vacant places were designed to contain portraits of distinguished jurists, but the great trouble has been to find them. Kent, Story and Livingston were in stock and were put to immediate use, their features now being on the wall, and Parsons (he of Contracts) and Greenleaf have been voted places. But here the material has given out, and they are looking around for jurists of sufficient original merit to fill in with. In the halls above — the Senate lobby and reception rooms — it is proposed that the portraits of Vice-Presidents who have never become Presidents should be used to complete the fresco, but nothing in this direction has ever been done. In the frescoing on the walls of the Senate Committee on Foreign Affairs are the portraits of Henry Clay, Charles Sumner, William Allen and Simon Cameron. The faces of Washington, Jefferson, Hamilton, Fulton, Franklin and Fitch appear in appropriate places, and there are, of course, many other portraits, but they are out of the realm of allegory and are not actually a part of the frescoing. The great difficulty, as in the case of the present artist at work on the frieze work about the walls of the dome, has always been the absence of proper allegorical subjects. The artists have always painted themselves out of history before they got half through the walls.—*N. Y. Mail and Express.*

COMPETITIVE DESIGNS FOR A CHEAP STABLE, SUBMITTED BY "*Tom*" AND BY "*Festina lente II.*"

The design by "*Festina lente II*" is accompanied by the subjoined proposal:

BOSTON, December 19, 1884.

MR. "*Festina lente*," ARCHITECT: — We propose to furnish all materials and labor required in the erection and full completion of stable, according to designs and description given, for the sum of $1,475. Respectfully submitted,
GELDERT & WHITE.

STABLE FOR S. J. MEEKER, ESQ., NEWARK, N. J. MR. JOHN E. BAKER, ARCHITECT, NEWARK, N. J.

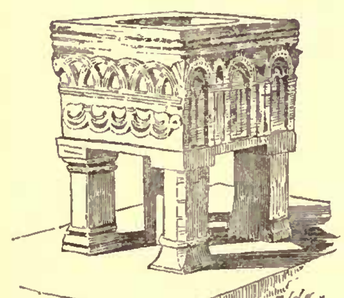
The first and second stories are of Hackensack brick laid in red mortar. The third floor and gables are enclosed with pine shingles, stained. Stalls are fitted up on first and second stories. Second-story floor is of concrete blocks supported on iron beams. The stable is fitted up in hard wood throughout, and has all the modern improvements. Size 32′ x 62′.

STAIRCASE IN THE PLAZZO DEI CONTI GUIDI, CASENTIONO, ITALY,

APSE OF THE CATHEDRAL, PIACENZO, ITALY.

TALL CHIMNEY CONSTRUCTION.[1] — V.

VENTILATING CHIMNEY-SHAFTS.



A VENTILATING chimney-shaft was erected at the American Print Works, Fall River, Massachusetts, from the designs of Mr. Joseph A. Miller, of New York. This chimney is one of a class of which several have been erected by Mr. Miller, and its construction includes several peculiarities worthy of notice. In the first place there is formed at the base of the shaft an enlargement or hot chamber into which the waste gases are delivered by the flues, this chamber being in some of Mr. Miller's chimneys more than twice the diameter of the main portion of the shaft. In the present instance the diameter of the chamber is ten feet, and its height twenty feet, while the diameter of the main shaft is six feet, except just where it joins the chamber and at the top of the cap of the inner shaft, at both which points its diameter is five feet. The object of the enlargement or chamber is to allow the currents from the flues to be gradually diverted to an upper course, and it is more particularly useful when two or more flues open into the same chimney, and where, consequently, there are conflicting currents to contend with.

The shaft is double for the main portion of its height, the light inner shaft being the chimney proper, whilst the outer casing serves to protect the inner shaft, and at the same time forms an annular flue which is available for ventilating purposes. The inner shaft is surmounted by a cast-iron cap, this cap being built up of sections of such a shape that the centre of gravity of each section falls within the line of the bases, and the sections thus tend to fall together, and form a kind of arch. Each section is connected to that next it by two bolts; but from the shape given to the sections they will maintain their positions even if the fastenings were corroded away. The sections are provided at their bases with flanges which give them a secure hold of the top of the shaft. The cap which surmounts the outer casing is constructed on the same principle as the inner cap, but the sections of which it is composed are provided at their bases with flanges gripping the shaft both within and without.

When a high wind blows over the top of an ordinary chimney it acts to a certain extent as a damper and checks the draught, as any one who will watch the smoke escaping from a chimney on a windy day can easily see for himself. In the chimney now being described, the action above mentioned has been avoided, by making the inner shaft of somewhat less height than the outer one, and by piercing the latter with openings, which allow the wind to impinge upon the sides of the cap of the inner shaft. The shape of this cap causes the air entering through these openings to be deflected upwards, and this, by the well-known action of induced currents, rather assists the draught of the chimney than diminishes it.

The inner shaft of the chimney is of circular form, whilst the outer casing is octagonal, four of the sides projecting for the width of a brick beyond the line of the others. This projection of the four sides not only greatly improves the architectural effect of the shaft, but also enables the latter to be built without the use of the cut bricks required for ordinary octagonal or circular shafts. As far as possible all projections on the exterior of the shaft have been avoided, as they obstruct the upward flow of air, which is always taking place over the surface of a wall and cause eddies, which interfere to a greater or lesser extent with the free escape of the gases which the chimney is built to carry off.

We have already referred to the annular space between the inner and outer shafts, and it is the existence of this space which renders the chimneys of the class we are describing peculiarly applicable for assisting ventilation. In the case of the chimney we illustrate, the annular space has a least sectional area of 2,200 square inches, and with the gases in the chimney at a temperature of from 400° to 450°, the exhaustion in the annular flue amounts to 1.15 inch of water, whilst with a high wind blowing, this is increased to 1.3 inch.

The theoretical velocity of the inflowing air due to the first-mentioned exhaustion would be about seventy feet per second, and the annular flue would then be theoretically capable of carrying off $\frac{2200 \times 70}{144} = 106.9$ cubic feet of air per second. Of course, however, this quantity would be liable to considerable reduction in practice, owing to the resistances in the air passages, etc. The exhaustion in the inner shaft varies from 1.4 to 1.5 inches of water, according to the state of the atmosphere and other circumstances.

At the Great Falls Manufacturing Company's Works in New Hampshire, a chimney of the same class as that we have described has lately been erected in the centre of a projecting tower containing the water closets, etc., these being connected with the annular flue of the shaft, so that a strong current of air is continually drawn through them.

MESSRS. ABRAHAM STOTT AND SON'S CAVITY CHIMNEY, OLDHAM.

Height of chimney, 165 feet.
Diameter at base, 16 feet by 5 feet by 3 inches thick.
Diameter at top, 7 feet 6 inches.
Height of cavity, 90 feet, 3 feet thick.

After completion it leaned over considerably on one side, and the owners entered into a contract with two brothers who were chimney builders, to "saw" the chimney; but instead of sawing, they took out a whole course of bricks, and, while one of the men was on a scaffold about a third of the distance from the ground engaged at the work, the stack fell over, except about thirty feet from the base, and killed the man who was working at the time.

CAVITY CHIMNEYS.

This form of chimney is frequently built in the North of England: the inner ring is carried up vertical of four-and-a-half inch fire-brick for say twenty to thirty feet high, until it nearly closes with the main shaft.

The outer or main shaft is started with fourteen-inch work at base, and diminishes or batters regularly towards the top.

ABBEY MILLS SHAFT.

Extract from letter: —

I took no account of the work till we reached the top of base or starting of column.

Concrete, 30 feet 6 inches by 30 feet 6 inches by 8 feet thick.

York landings. — Two layers of York landing six inches to cover the whole of the concrete—bedded solid.

Brickwork from top of base to underside of stone head, one hundred and thirty-one feet.

Bricklayers' Time.—Time of bricklayers and laborers from stone base to underside of stone head, five hundred and twenty-five days; bricklayers' laborers, five hundred and ninety days.

Cost of Labor only.—About £8 per rod.

Time.—Started laying bricks on stone base 20th of July, 1867; finished the column to underside stone head, 9th of November, 1867.

Portland Stone.—Top of column or stone head, nine hundred cubic

[1] Continued from page 115, No. 506.

feet or sixty tons; masons, seventy-two days; laborers one hundred and forty-four days, for getting up and fixing only; this is about 1*s.* 2*d.* per foot.

Raising Bricks, etc.—The means of raising the bricks and stones on shaft was by a small donkey engine, chains fixed round wheel top and bottom of shaft after we got fifty feet high.

Scaffold.—Time made in building scaffold, and also taking down same, six hundred and seventy-seven days building, and one hundred and fifty for pulling down.

Scaffold.—Number of scaffold poles used for one shaft only

Poles to shaft	428
Poles to barrow lift	18
	446

Cords used to standards	324
" " barrow lift	54
" " braces	216
" " ledgers	544
	1138

Twenty-seven tons of iron-work used on stonehead.

ON THE ROYAL PORCELAIN WORKS, WORCESTER, THERE ARE THREE LARGE STACKS, VIZ.: —

1st. Octagonal, about one hundred feet high, with a fine ornamental top in brickwork. This chimney, owing to the foundations giving way, was in 1866 two feet four inches out of the perpendicular; but in that year was set upright by a piece being sawn out of one side at the base.

2d. Is a chimney erected in 1866. The base is fifteen feet square. It is carried up square for thirty feet; then in an octagon shape; and finally, in a circular form to the height of one hundred and seventy-one feet. Forty feet of the shaft is ten inches in thickness, being composed of double bricks; while the remainder is of single bricks, 13 inches by 5½ inches with a groove in the centre. The stack is screwed down with eight iron pins, and there are iron rings and supports every twelve feet. The cornice is made of brick, and the whole is surmounted by an iron cap over two tons in weight. At the time this chimney was built only one other had been erected on the same principle—namely, at Buckley, Morton, in North Wales; but that one is not so high.

3d. Is about one hundred and eighty feet high, and forty-eight feet diameter at the base. It is built in a square form, and has no pretensions to ornament.

RETORT HOUSE SHAFT AT THE SOUTH METROPOLITAN GAS WORKS, OLD KENT ROAD, LONDON.

Cost £530.

Total height above ground line, one hundred and eight feet.

Depth from ground to bottom of concrete foundation, nine feet nine inches.

Flue five feet square, and parallel throughout its length.

Eighty thousand bricks used in the structure.

Weight of cast-iron cap, two tons.

The interior of the flue is lined with fire-bricks throughout its height, the fire-bricks being built in with the stock-bricks in old English bond of alternate layers of headers and stretchers, so that the courses of fire-bricks are alternately nine inches and four-and-a-half inches thick, and were specially obtained for this chimney of the same size as the stock-bricks.

The retort house shaft, erected in 1862, has been in work ever since, and has not burnt away at all; the fact is, the heat of a chimney is not sufficient to injure good fire-bricks.

Fire-bricks are usually thinner than stocks. Mr. Livesey sometimes adopts the plan of bonding them into the stocks every sixth or eighth course, where the courses coincide.

In a similar chimney-shaft, seventy feet high, recently erected entirely of fire-bricks for the new engine-house at these gas works, Mr. Livesey carried up the fourteen-inch work about fifty feet, and then reduced it to nine-inch work to the top by a set-off inside, so that the flue is larger at the top than the bottom.

FLOUR MILL CHIMNEY-SHAFT, BOSTON.

Built from designs and under superintendence of W. H. Wheeler, C. E., Boro' Survey of Boston, Lincolnshire.

Height from floor line of mill, one hundred and five feet three inches to top of cap.

Cost about £350.

There are about sixteen rods of brickwork in (it is not measured solid) and

About seven hundred and forty feet cube of Bramley Fall stone.

Iron cap at top four feet six inches diameter, nine inches wide, nine inches deep on inside, and three inches deep on outside, and one-inch thick, with flanges and bolts.

The chimney is built on piles, nine in number; the shoes of piles are thirty feet below floor line of mill.

The upper part of soil is silty clay, and the lower part hard clay and chalk stones.

CONCRETE CHIMNEY AT SOUTH DOCKS, SUNDERLAND.

In compliance with the requirements of the Board of Trade, the River Wear Commissioners have erected from the designs of their engineer (Mr. H. H. Wake, Assoc. Inst. C. E.), large chain cable and anchor testing works, at their South Docks at Sunderland.

The whole of the buildings are constructed of concrete, built with Tall's patent apparatus, by Mr. George Grainger. The design included two boiler-house chimneys, one of which has just been completed, and as it is believed to be the first chimney of the kind built of concrete, and without scaffolding, in this country, some brief description of the manner of its erection may be of interest. The chimney is carried up square until it is well clear of the level of roof of testing-house, the dimensions being 22 feet 3 inches by 7 feet 6 inches by 7 feet 6 inches, the construction of this portion presenting no feature of novelty. At this level the corners are gradually taken off the square base, until at the height of twenty-four feet nine inches above the surface of ground, it is brought into the octagonal form of the tapering portion of the chimney, that the profile of base mould might be shown to greater advantage. This octagonal and tapering portion of chimney, in which the interest and difficulty of the work chiefly centred, was moulded in the following manner: — Panels three feet in height were formed of three-quarter inch boards, hinged together in pairs at their outer edges, being so proportioned that the lines of their inner edges, when produced, came into one point at the centre at half the height of this section of the chimney, the intermediate space being made up by a wedge piece, which after the concrete poured between the panels on inside and outside of chimney walls had set, was easily reduced to meet the decrease in size on the next left due to the batter, this reduction being just sufficient to take off the holes in one side of the wedge for the stud bolts, which connected it to the upright members of the frame. When the stalk of chimney had been carried up to the half of its full height these panels were sufficiently reduced to admit a second set of intermediate wedges of exactly the same dimensions as those introduced at the level of base mould, bringing the inner edges of the reduced panels into one point at the centre of the top of chimney in a manner similar to that in which, at their original dimensions, they had been brought together at half of its height, affording a tolerably severe test of the accuracy of the work, which it was found to bear admirably, for the uprights being six feet in length, and always being moved with the panels which were only half that height, they had a continual hold of three feet on the completed portion of the work, which sufficiently insured regularity in line. The chimney when completed was stuccoed with cement, and drawn in courses to imitate stone; it is considered to present an excellent example of concrete building, both as regards strength and appearance, the latter being of a highly ornamental character, the chimney being exactly perpendicular, and the mouldings, which were formed in their respective positions, clear and sharp in outline. The concrete for the work was specified to be mixed at the rate of one part of Portland cement to eight of gravel, but in the case of the chimney the proportion was increased to one in five by the contractor, by whom also the simple and efficacious arrangement used in building was devised.

THE GRANT MEMORIAL.

WASHINGTON, D. C., September 21, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—If the suggestions contained in the letter of prominent architects to the Grant Monument Committee are carried out, it would be gratifying to see the author of the best design in the *American Architect* competition of September 19 placed on the list among the selected ten. Yours respectfully,

X. Y. Z.

NEWPORT, R. I., September 22, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Referring to the letter that you published in your issue of September 19, addressed to the chairman of the committee for the erection of a monument to General Grant, and signed by some of the best-known architects in the country, I would ask what is to be understood when it is suggested that the "American Institute of Architects be invited to send names of ten members of the profession in this country whom it considers best qualified to make an appropriate design for the monument?" I presume that it can only mean that each and every member of the Institute be requested to send in the names of the ten members best qualified, in his estimation, and the ten receiving the largest number of votes to be considered elected. But who is to say that there are but ten men in the profession best qualified to make such a design, and who of us would be able to decide conscientiously which ten out of all the architects of the country should merit his choice, for even among that small proportion of the whole number with whose work each one of us may be more or less acquainted, our estimate of their capabilities is largely based upon our knowledge of the buildings that have fallen to their lot to execute, and not upon our knowledge of their education, acquirements and capacity for more important works; and would not such a method of attempting to elect the most capable be open to the suspicion that some voter, hoping to be one of the lucky ten, would think it less prudent to vote for the ten strongest men in the profession than to vote for some lesser lights to compete against him in his struggle for the prize?

Would the practical business men of the country look with favor and confidence upon a proposition that the ten chosen and paid competitors for the great prize should exclusively among themselves prepare the programme for such competition, besides having half the voice in deciding whose design should be considered best? Could such a jury passing upon its own work be held free from suspicion of impartiality? and would the outside architects to whom the competition would be open, if they were "desirous of sending in a study," be likely to stand as good a chance for the prize as the selected ten? We all believe that the members of the American Institute of Architects are above any such suspicions, but what is to be gained by placing them in such a trying position and in a position where ordinary business men would *not* be held above suspicion?

Mr. Alex. Doyle's remarks to a reporter of the *World* the other day, on the subject of an artist's scheme for a grand national competition, seemed to me to be very practical and much to the point.

In the first place the monument committee will never receive its million of dollars from the public until the public has some more definite idea of what it is going to get for its money. It seems to me that the first step of the committee should be to inaugurate a grand national competition which should be open to all, and which in itself would do more to enlist popular interest in the subject than anything else that could be done; and that when once a design had been chosen and elaborated, subscriptions could be solicited for something tangible and with much more probability of success. A large sum of money might even be obtained by an exhibition of the designs submitted, and a fee might be charged for the privilege of voting for the best.

The committee in compiling and issuing its programme to architects should secure the advice and coöperation of a certain number of professional men of acknowledged ability. Their programme should stipulate irrevocably the date beyond which no design would be accepted. It should hamper the competitors as little as possible with restrictions either as to cost, materials, size or otherwise. It should insure to the author of the best design the execution of the work at a fee of five per cent on the total cost. It should offer a certain number of prizes: say five first prizes of two thousand dollars each; ten second prizes of five hundred dollars, and twenty third prizes of two hundred and fifty dollars each.

It should stipulate that the designs will be judged by and prizes awarded on a certain fixed date, and by a jury composed of say ten members of the monument committee and ten non-competing architects of acknowledged ability (which ten might also be selected by vote of the competing architects, or by the American Institute of Architects), and who should be paid for their services.

If a programme should be thus carefully drawn up, if the prizes offered should be liberal, and if the jury of award should be composed of competent and as far as possible disinterested men, I believe that the competition would undoubtedly enlist the best efforts of the whole profession, and there would be no insurmountable difficulty in deciding which were actually the best and most appropriate designs, instead of attempting to guess at who would probably be best qualified to make them.

The system of selecting ten would undoubtedly give good results, but it would be discriminating in favor of the best known and most experienced of the profession, whereas a competition offering equal advantages to all would surely result in such a demonstration of the artistic resources of the country as no ordinary competition has heretofore ever been able to bring forth. Respectfully yours,

Alfred H. Thorp, A. A. I. A.

NOTES AND CLIPPINGS.

Raising the Mississippi by Opening the Reservoirs. — The Government engineers have made the following report on the reservoir system: The reservoirs at Leech Lake and Lake Winnebagosish were opened on August 1, with a large discharge. Pokegama Reservoir, the receiving reservoir, 100 miles by water below the upper reservoir and 398 miles by water above St. Paul, was opened on August 15, with a discharge of about 3,000 cubic feet of water per second. The rise in the Mississippi River at different points since, and resulting from, the discharge from the reservoirs was on September 1, at Grand Rapids, four miles below Pokegama, five feet; Aitken, 169 miles below Pokegama, two and one-half feet; Crow Wing, 236 miles below Pokegama, two feet; Sauk Rapids, 295 miles below Pokegama, two feet. The river at St. Paul fell from August 1 to August 23 one foot and three inches. Since then the St. Paul gauge shows an average stage of three feet up to September 7. As there was no rainfall of any importance rom August 1, the river must have continued falling at about the same rate as its tributaries, and probably at not far from the same proportion as from the 1st to the 23d of August, had it not been for the supply from these reservoirs. As closely as can be estimated, the reservoirs are now furnishing not far from one foot of water at St. Paul. These reservoirs have only been completed at Leech Lake, Lake Winnebagosish, and Pokegama Falls. The last is a distributing reservoir with little holding capacity. The first two have a capacity jointly of about 6,000,000,000 cubic feet when full. The fourth reservoir at Pine River will be completed this fall. It has a holding capacity of 7,000,000,000 cubic feet, and is about 220 miles by water above St. Paul. The accumulation of water in the upper reservoir of Lake Winnebagosish and Leech Lake in 1885 has been very large — between 35,000,000,000 and 40,000,000,000 cubic feet. A much larger discharge could have been made, but the amount was considered large enough for the experimental discharge this season. In regard to the diminished rise in the river as the distance from the point of discharge increases, it must be remembered that all sloughs, rivers, lakes, etc., adjunct to the river must be raised to the same height as the main river before the full effect and benefit can be received. It is expected that the total rise at Crow Wing and Sauk Rapids will not be far from four feet when the full effect is reached. It is as yet impossible to say what the full increase at St. Paul will be. Something between one and one-and-a-half feet can, however, be confidently expected. While the prevention of the river falling is less noticeable than the rise, yet the real effect is the same so far as navigation is concerned. — *New York Times.*

An Echo from the Boston Library Competition. — A while ago the city offered rewards for the best plans for the new Public Library which could be submitted. Architects in New York undertook to compete for the prizes, and were successful. The first prize was $4000, and the second prize $2000. They gave Mr. Brown (an absconded lawyer) power of attorney to collect the money, which, it is said, he did. He sent them $500 on account, and two or three days ago they came on to collect the balance, but they found his office in charge of sheriff's officers. — *Boston Herald.*

The Largest Railway Station. — The largest railroad station in the world is that belonging to the Northwestern Railroad Company at Birmingham, England, which has been completed and opened for passenger traffic. One thousand men have been employed in its construction for two and a half years. It has cost in its construction $5,000,000, and covers twelve acres of ground. There are tunnels at either end, and through them four hundred trains pass each day. The length of the platforms exceed a mile and a half. There are five signal-boxes for working the traffic, each of which contains one hundred and forty-four point and signal levers, and is operated by seven men. Six locomotives do the switching in the station. The whole is arched — roofed-in with arched glass roofing upon the Paxton principle. — *Railroad Record.*

The Queen Anne in Front of St. Paul's. — The statue of Queen Anne in front of St. Paul's Cathedral, which has been in a dilapidated condition for many years, is now in the course of demolition, and a replica in Sicilian marble, which Mr. Richard Belt is executing by order of the corporation, will be put in position on its completion. The statue, which was the work of Francis Bird, was erected in the church-yard in 1712. The sculptor received £250 for the Queen's statue and enrichments, £220 each for the four statues seated on the pedestal, of England, France, Ireland and America, and £50 for the white marble coat of arms; so that this "ill contrived and tasteless group," as Malcolm in his "History of London" calls it, cost in all £1180. Garth wrote some bitter lines upon the group: —

> France above with downcast eyes is seen,
> The sad attendant of so good a Queen.

The effigy had been allowed to get into such a wretched state — the figures on the pedestal being armless and faceless, and the Queen's face disfigured by the loss of a nose, which was struck off by a lunatic — that for very shame the corporation recently determined to deal with it, though it belonged to the trustees of the fabric of St. Paul's — viz.: the Archbishop of Canterbury, the Bishop of London, and the lord mayor for the time being. It was a question whether bronze or marble should be used, and whether another subject instead of Queen Anne should be chosen; but it was eventually decided to order a replica of the existing statue in Sicilian marble, and the commission was entrusted to Mr. Belt. — *London Daily News.*

Westminster Abbey. — The name Westminster Abbey is shortened from the fuller phrase, Westminster Abbey Church: the church, that is, of the Abbey of Westminster. It at once carries us back to its early history. Up to the year 1540, in the reign of Henry VII., the Abbey, as we call it to-day, was the church of a great Benedictine monastery. These monasteries, once thickly strewn throughout England and much of Europe, were called abbeys from being ruled by abbots (or *abbats*, from *abbas*, Syriac for father), as those governed by a prior were called priories. A great society of monks lived in buildings, of which the present deanery, the Jerusalem Chamber, etc., the cloisters, the chapter house, formed parts. The Abbey, as we call it, was the church in which these monks worshipped. Its legal title was *Ecclesia Abbatiæ Westmonasteriensis.* Hence its traditional designation. It is not a cathedral. By a cathedral we mean a church situated in a city which gives its name to an episcopal see (Fr. *siège*, "seat") and in which a bishop has his raised seat or throne (Gk. *kathedra*) assigned to him. St. Paul is the cathedral of London. For a brief space in its long history (a. d. 1540 to a. d. 1550) the Abbey was the cathedral of a diocese of Westminster. For a few years afterward (under Edward VI) it was declared by act of Parliament to be "a cathedral in the diocese of London." But the question still remains, What is it that gives the Abbey its unequalled historic interest in the eyes of all who speak our language? why should Nelson have named Westminster Abbey rather than York Minster or Canterbury Cathedral, or St. Paul's, where he was actually buried? It arose from the following causes: Edward the Confessor's great church was close to his own palace. It was designated by him for his own burial place. He was interred before the altar within a few days of its consecration. From that moment, Norman kings, monks, clergy and the English people vied with each other in honoring his name. William the Conqueror based his claim to the crown on an alleged gift to the king, who had long lived in exile in Normandy. To the monks he was dear not only from his munificent donations, but as being in life and character almost one of themselves. The commons of England, groaning under a foreign yoke, looked back to the peaceful reign of the pious and gentle Confessor, the last king of the old English stock, as to a golden age. To be crowned by his graveside lent an additional sanctity to the rite, and thus from the Confessor to Queen Victoria every reigning sovereign has received the crown beneath this roof, within a few yards of the dust of the Confessor. — *Dean of Westminster.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

326,450. SPEAKING-TUBE. — Pedro Pereira y Albizu, Madrid, Spain.
326,473. RADIATOR. — Charles E. Ashcroft, Lynn, Mass.
326,486. SHUTTER-FASTENER. — Joseph S. Dunham, Salem, N. J.
326,496. WATER-CLOSET ATTACHMENT. — William H. Graham, St. Louis, Mo.
326,507. LOCK. — Archibald Kelly, Newark, N. J.
326,514. SCAFFOLD-BINDER. — Joseph A. Moross, Detroit, Mich.
326,528. WATER-CLOSET VALVE. — Earnest A. Straat, Jersey City, N. J.
326,541. HOT-AIR FURNACE. — John R. Barker, Chicago, Ill.
326,543. ROTARY ENGINE OR PUMP. — Charles H. Cary, Bristol, R. I.
326,544. STRUCTURE FOR SUBMARINE SEWERS. — Henry Case, Brooklyn, N. Y.
326,548. GATE-HANGER. — Issachar Crowfoot, Hartford, Wis.
326,550. GAS OR VAPOR BURNER. — Michael B. Dyott and Charles G. Dyott, Philadelphia, Pa.
326,561. GAS-ENGINE. — George M. Hopkins and I. Newton Hopkins, Brooklyn, N. Y.
326,568. SPEAKING-TUBE. — John A. Kessel, Buffalo, N. Y.
326,569. APPLIANCE FOR PREVENTING DIRT FROM PASSING INTO PIPES. — John Kirkaldy, 40 West India Dock Road, County of Middlesex, Eng.
326,571. CHURCH-PEW. — Israel Lancaster, Chicago, Ill.
326,582. DETACHABLE TABLE-LEG. — Walter A. Osborn and David M. Estey, Owosso, Mich.
326,583. CIRCULAR SAWING-MACHINE. — John H. Palm, Minneapolis, Minn.
326,593. GASKET FOR MAN-HOLES. — William T. Y. Schenck, San Francisco, Cal.
326,598. HOT-AIR FURNACE. — Isaac D. Smead, Toledo, O.
326,605. WINDOW. — Samuel C. Taylor, Morton, near Bingley, County of York, Eng.
326,611. ART OF MAKING PLUMBERS' TRAPS. — James A. Whitney, Dobbs Ferry, N. Y.
326,612. PLUMBER'S TRAPS. — James A. Whitney, Dobbs Ferry, N. Y.
326,616. FIRE-ESCAPE. — Hezekiah O. Woodbury and Seth T. Thacher, Jr., Beverly, Mass.
326,620. SWINGING GATE. — Hugh B. Bookout, Long's Mills, Tenn.
326,626. COMBINED LATCH AND LOCK. — George H. Chubb and Harry W. Chubb, London, Eng.
326,629. KETTLE DRAINER AND STEAM VENTILATOR AND CONDUCTOR. — Jane A. Clother, Cumberland, Wis.
326,635. LUMBER-TRIMMER. — Moses Dutrisac, Muskegon, Mich.
326,647. GUTTER AND SPOUT. — Louis J. Hardy, Rouen, France.
326,655. METALLIC SHINGLE. — John T. Hyndman, Cincinnati, O.
326,673. LOCK. — Anthony Paciorkowski, Troy, N.Y.
326,674. STOP-COCK BOX FOR WATER AND GAS PIPES. — Louis P. Reichert and Andrew Fuller, Buffalo, N. Y.
326,683. DEVICE FOR INSERTING AND WITHDRAWING REMOVABLE SAW-TEETH. — George F. Simonds, Fitchburg, Mass.
326,684. SAW WITH INSERTIBLE TEETH. — George F. Simonds, Fitchburg, Mass.
326,685. INSERTIBLE-TOOTH SAW. — George F. Simonds, Fitchburg, Mass.
326,713. SIPHON WATER-TRAP. — William P. Buchan, Glasgow, County of Lanark, Scotland.
326,729. BLIND-HINGE. — Richard Ghiselin, Webster Groves, Mo.
326,735. FIRE-PROOF FLOOR. — William W. Hazlitt, Toronto, O.
326,736. PENCIL OR CRAYON HOLDER. — Joseph Hoffman, New York, N. Y.
326,784. HINGE. — John A. Resch, Jersey City, N.J.
326,799. GUIDE FOR WINDOW-CURTAINS. — Franklin B. Snook and Daniel Death, Franklin, O.
326,839. APPARATUS FOR TRANSFERRING HEAT FROM ONE CURRENT OF AIR TO ANOTHER. — Charles L. Braithwaite, Jr. and Isaac Braithwaite, Kendal, County of Westmoreland, Eng.
326,848. SASH-FASTENER. — Cary O. Cole, Letts, Ia.

SUMMARY OF THE WEEK.

Baltimore.

DWELLINGS. — Charles E. Cassell, architect, is preparing plans for the following: —

Five three-st'y basement and attic brick and Belleville brown-stone buildings, with ornamental brick panels, each 18' 8" x 65', for P. L. Cutting, Jr., of New York, to be erected on Charles St., bet. Preston and Hoffman Sts., and to cost $8,000 each; R. Curley, superintendent.

Fifty-nine three-st'y brick and brown-stone buildings, 14', 15', 16' x 60', for Messrs. Smith & Schwartz, to be erected on Calvert, Sumwalt and Shirk Sts.

Five four-st'y and basement brick and brown-stone (Coon.) buildings, each 18' 8" x 62', for Richard Courtney, Esq., to be erected on Charles St., s of Boundary Ave., and to cost $7,000 each.

BUILDING PERMITS. — Since our last report twenty-three permits have been granted, the more important of which are the following: —

Chas. H. Callis, 12 two-st'y brick buildings, w s Gay St., e of Broadway.

Henry Westphal, 8 two-st'y brick buildings, n s Heath St., bet. Patapsco and Charles Sts.; and 3 two-st'y brick buildings, w s Patapsco St.

John Burger, three-st'y brick building, w s Bond St., bet. Thames and Lancaster Sts.

Louis Ripple, 3 three-st'y brick buildings, n s Lexington St., bet. Vincent Alley and Mount St.

J. C. Purcell, 3 three-st'y brick buildings, w s Stricken St., n of Patterson Ave.

Franz Thoene, three-st'y brick building, n s Eastern Ave., bet. Ann and Durham Sts.

Birmingham, Ala.

BUILDING PERMITS. — The following building permits have been issued since our last report: —

B. F. Roden, three-st'y brick business house, 50' x 100'; cost, $16,000; Chas. Wheelock, architect.

Louis Braun, two-st'y frame house; cost, $2,000.

Williamson Iron Company, blast furnace; cost, $250,000.

T. C. Porteous, two-st'y brick house; cost, $5,000; H. Haley, builder; architect, Chas. Wheelock.

Moore, Moore & Handley, three-st'y brick and stone business house, 36' x 100'; cost, $10,000; architect, same as last.

Morris Bros., three-st'y brick business house, 50' x 150'; cost, $14,000; T. C. Thompson & Co., builders; architect, same as last.

Colored Methodist Episcopal Church, brick church; cost, $5,000.

J. C. Kyle, two-st'y frame house; cost, $3,000; T. D. Lipes & Co., builders; C. Wheelock, architect.

Dr. Henley, two-st'y frame house; cost, $3,000; Oliver Marble & Son, architects.

J. E. Ellis, two-st'y brick dwell.; cost, $3,000.

Mrs. Read, two-st'y frame building on Highlands; cost, $3,000.

H. C. Ansley, two-st'y frame house on the Highlands; cost, $3,000.

M. C. Wimberly, one-st'y frame house; cost, $3,000; Green & Co., builders; Chas. Wheelock, architect.

W. C. Ward, two-st'y frame house on Highlands; cost, $4,000; architect, same as last.

G. L. Morris, two-st'y residence on Highlands; cost, $3,000; T. C. Thompson & Co., builders; architect, same as last.

Jefferson County Almshouse, two-st'y frame building; cost, $5,000; architect, same as last.

Harris & Linn, three-st'y brick business house; cost, $7,000; G. L. Rousseau, architect.

Boston.

BUILDING PERMITS. — *Wood.* — *A St.*, dwell., 19' x 27', E. B. Spinney, owner; D. A. Berry, builder.

Emerson St., *No.* 71, dwell., 25' x 37'; Owen Tappen, owner.

Reedsdale St., near Brighton Ave., dwell., 25' x 31'; John A. Smith, owner; J. E. Brown, builder.

Washington St., opp. Matchett St., dwell., 22' x 32'; C. M. Tillinghurst, owner; D. McConnell, builder.

Jarvis Pl., off George St., dwell., 21' x 25'; Owen Lynch, owner; John M. Kelley, builder.

Washington St., dwell., 21' x 29'; M. J. McKenna, owner; James T. Chrisholm, builder.

Austin St., near Washington St., dwell., 22' x 41'; M. J. McKenna, owner; Jas. T. Chrisholm, builder.

Austin St., dwell., 24' x 31'; M. J. McKenna, owner; James T. Chrisholm, builder.

Brooklyn.

BUILDING PERMITS. — *Wallabout St.*, s s, 200' w Marcy Ave., one-st'y frame stable and car-shed, paper roof; cost, $3,000; owner and builder, B. C. R. R. Co., 10 Fulton St.; architect, A. W. Dickie.

Twenty-seventh St., s s, 273' e Third Ave., 3 two-st'y frame dwells., tin roof, paper lining; cost, each, $4,500; owners, J. T. Smith & Co., 272 Fifty-second St.; architect, S. B. Bogert; builders, H. J. and W. S. Skinner.

Luquer St., n s, 80' w Henry St., three-st'y brick tenement, tin roof, wooden cornice; cost, $3,000; owner, architect and mason, R. E. Toppin, 369 Franklin Ave.; contractor, H. S. Hawkes.

Nostrand Ave., e s, 150' n Atlantic Ave., three-st'y brick flat, tin roof, wooden cornice; cost, $8,000; owner, Geo. Penniman, 57 Irving Pl.; architect, W. M. Coots; builder, D. H. Fowler.

Gates Ave., s s, 150' w Stuyvesant Ave., 4 three-st'y brick stores and tenements, tin roofs, wooden cornices; cost, each, $7,000; owner, L. P. McGarry, 583 Monroe St.; architect, J. McGarry.

Meeker St., *No.* 135, n s, 85' 7" w Monitor St., three-st'y frame (brick-filled) dwell., tin roof; cost, $4,500; owner and builder, Henry Bindrim, 133 Meeker Ave.; architect, Th. Engelhardt.

Third Ave., n w cor. Thirteenth St., three-st'y frame store and dwell., tin roof; cost, $4,000; owner, Ed. J. Sherlock, 585 Fulton St.; architect, C. F. Eisenach; builder, not selected.

Stuyvesant Ave., w s, extends from Putnam Ave. to Madison St., 10 three-st'y and basement and two-st'y and basement brown-stone dwells., mansard tin roofs, wooden cornices; cost, each, $5,000; owner, Kate M. McCormick, 372 South Second St.; architect, A. Spence; builder, R. Ferguson.

McKibben St., *No.* 175, n s, three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, Mr. Korad Schmidt, on premises; architect, H. Vollweiler; builder, J. Rueger.

Hancock St., *No.* 182, s s, 360' e Nostrand Ave., three-st'y and basement brown-stone dwell., tin roof, iron cornice; cost, $10,000; owner and architect, R. W. Gleason, 316 South Fifth St.; contractor, R. B. Ferguson.

Sumpter St., n s, 25' w Howard Ave., two-st'y frame (brick-filled) store and dwell., tin roof; cost, $4,500; owner, Mr. Hale, on premises; architects and contractors, Ames & Waldron; mason, E. Sutterlin.

Myrtle Ave., *Nos.* 1264-1272, s w cor. Cedar St., 3 three-st'y frame stores and tenements, tin roof; cost, $12,000; owner and builder, Fred'k Herr, 782 Broadway; architect, Th. Engelhardt.

Gerry St., *Nos.* 77 *and* 79, 2 three-st'y brick factory and tenements, tin roofs; brick and iron cornices; cost, each, $3,500; owner and builder, A. Meth; architect, H. Vollweiler.

Decatur St., n s, 250' e Reid Ave., 3 two-st'y and basement brown-stone dwells., tin roofs, wooden cornices; cost, $4,500; owner, Elizabeth Phelan, 362 Hart St.; architect, T. F. Thomas; builder, J. Phelan.

President St., n s, 225' e Eighth Ave., 11 three-st'y and basement brick dwells., metal roofs, wooden cornices; cost, each, $9,000; owner and architect, Wm. Flanagan, 46 Berkeley Pl.; builder, W. Flanagan.

ALTERATIONS. — *Ash St.*, s s, 81' w Oakland Ave., two-st'y brick extension, gravel roof; cost, $3,500; owner and builder, Church & Co., 36 Ash St.; architect, M. R. Wood.

Livingston St., *No.* 61, flat roof, front, brick front removed and new brown-stone front and interior alterations; cost, $10,000; owner, H. Strohm, 266 Atlantic Ave.; architect, C. Werner; builders, J. J. Bentzen and Th. Brown.

Chicago.

BUILDING PERMITS. — L. Knipp, three-st'y store and dwell., 892 Milwaukee Ave.; cost, $6,000.

F. Lauerman, two-st'y dwell., 2619 Portland Ave.; cost, $3,000; architect, J. Frank.

A. W. Shearson, two-st'y dwell., 1131 Lexington St.; cost, $2,500.

L. Malsacher, three-st'y dwell., 355 North Franklin St.; cost, $5,000; architect, F. Pigos.

E. Ayres, 3 two-st'y dwells., 62-66 North Ada St.; cost, $10,000; architects, Wheelock & Clay.

C. H. Harrison, 14 two-st'y dwells., 44-64 Nixon St.; cost, $28,000; architect, J. J. Flanders.

J. S. Chmidt, 2 three-st'y dwells., 170-172 Lasalle St.; cost, $10,000; architects, Furst & Rudolph.

R. E. Moss, six-st'y store, State and Michigan Sts.; cost, $30,000; architect, S. V. Shipman.

P. Ford, two-st'y dwell., 157 Sedgwick St.; cost, $4,000; architects, Furst & Rudolph.

B. D. West, two-st'y dwell., 968 West Jackson St.; cost, $5,500; architect, W. D. Carroll.

G. Peterson, three-st'y stores and flats, 9 Temple St.; cost, $6,000; architect, H. F. Harbruck.

J. W. Jackson, three-st'y flats, 33 North Centre Ave.; cost, $3,500.

C. Geyer, 2 two-st'y dwells., 519-523 Marshfield Ave.; cost, $8,000; architect, C. Geyer.

H. F. Gelderman, 2 three-st'y stores and flats, 523-525 Sedgwick St.; cost, $14,000; architect, A. F. Boos.

J. H. Bourn, addition, Thirty-third and Dearborn Sts.; cost, $7,000.

E. B. Bosse, three-st'y store and dwell., 506-508 North Clark St.; cost, $15,000; architect, T. Karls.

J. H. Hamlin, two-st'y dwell., 1621 Prairie Ave.; cost, $10,000; architects, Treat & Foltz.

Hughes & Crouch, 2 two-st'y dwells., 2801-1803 Michigan Boulevard; cost, $15,000; architects, Cobb & Frost.

C. Maher, two-st'y dwell., 3764 Indiana Ave.; cost, $4,000; architect, C. L. Stiles.

W. Dolan, two-st'y dwell., 241 Loomis St.; cost, $3,500; architect, G. Vigeant.

J. S. Smith, two-st'y dwell., 3408 Prairie Ave.; cost, $2,500; architect, H. R. Wilson.

Kansas City, Mo.

BUILDING PERMITS. — T. Smith, two-st'y brick business block, cor. Fifth St. and Grand Ave.; cost, $15,000.

Revel W. English, brick house on Broadway; cost, $5,000.

T. Munford, brick house on Broadway; cost, $6,000.

Hayes Bros., 6 frame houses on East Fourteenth St.; cost, $14,000.

S. C. Lee, frame business building, cor. Holmes and Twentieth St.; cost, $14,500.

New York.

ARMORY. — The corner-stone of the Twelfth Regiment's new armory, at Ninth Ave. and Sixty-first St., was laid September 26.

CHURCH. — The corner-stone of a new Roman Catholic Church at Rye Neck was laid September 27.

SCHOOL AND LODGING-HOUSE. — A school and lodging-house, five stories high, is to be built by the Children's Aid Society, on the n e cor. of Eighth St. and Ave. B, to cost $49,000.

BUILDING PERMITS. — *Eighty-fifth St.*, s s, 78' e Ave. A, five-st'y brick building, brick and brown-stone front, flat tin roof; cost, $15,000; Frederick Schenck, owner, n w cor. Ave. A and Eighty-fifth St.; John Brandt, architect, 1491 Third Ave.

East Seventy-ninth St., *No.* 413, four-st'y brick dwell., brick and brown-stone front, flat tin roof; cost, $20,000; owner, Rev. J. J. Dougherty, 334 East Seventy-ninth St.; architects, Babcock & McAvoy, 64 College Pl.

One Hundred and First St., n s, 300' w of First Ave., 4 five-st'y brick tenements, flat gravel roof; cost, $10,000 each; owner, Mary M. Gurnee, 79 Macon St., Brooklyn; architect, Albert Wilkinson, 924 Gates Ave., Brooklyn.

Ninety-fifth St., s s, 448' e Tenth Ave., and *Ninety-fifth St.*, s s, 100' e Tenth Ave., 9 three-st'y brick dwells., brick and brown-stone front, flat tin roof; cost, $12,000 each; owner and architect, Wm. J. Merritt, 152 and 154 West One Hundred and Twenty-seventh St.

Eighty-eighth St., s w cor. Lexington Ave., German Evangelical Lutheran Church, brick and granite, granite and limestone front, peak slate roof; cost, $78,000; owners, Trustees of the German Evangelical Lutheran Church, John G. Wm. Feldman, President, 1680 Park Ave.; architect, Arthur Crooks, 200 Broadway.

West Forty-eighth St., *No.* 348, five-st'y brick tenement, brown-stone front, flat tin roof; cost, $22,000; owner, Wm. Rankin, 253 West Fifty-first St.; architect, George Keister, 347 West Forty-third St.

West Seventeenth St., *Nos.* 410 *and* 112, 2 five-st'y

brick tenements, flat tin roof; cost, $13,000; owner John J. Burchell, 206 East Fifty-sixth St.; architects, A. B. Ogden & Son, 409 East Fifty-third St.

East Thirty-fifth St., Nos. 522, 524 *and* 526, on rear, six-st'y brick manufactory, flat tin roof; cost, $17,000; owner, John Graham, 354 West Thirty-third St.; architect, Andrew Spence, 2294 Third Ave.

Mulberry St., Nos. 244 *and* 246, five-st'y brick tenement, flat tin roof; cost, $13,000; owner, Anna C. Keane, 113 East Thirty-fourth St.; architect, John B. Snook, 12 Chambers St.

West Forty-eighth St., No. 350, five-st'y brick tenement, flat tin roof, brick and brown-stone front; cost, $22,000; owner, Edward D. Bertine, 328 West Forty-seventh St.; architect, George Keister, 347 West Forty-third St.

West Sixty-third St., n s, 100′ w of Ninth Ave., 10 brick dwells., brick, brown-stone and terra-cotta fronts; cost, six $18,000 each; four $20,000 each; owner, A. A. Hughes, 2063 Fifth Ave.; architect, Wm. B. Tuthill, 52 Broadway.

West Seventeenth St., No. 429, three-st'y brick dwell. and blacksmith-shop, flat tin roof; cost, $6,000; owner, Mrs. Emily Saddler, 360 West Seventeenth St.; architect, M. H. Rouillier, 2 West Fourteenth St.

West Seventeenth St., 150′ w Ninth Ave., 7 four-st'y brick dwells., brick and Nova Scotia stone fronts, flat roofs, mansard fronts covered with tin fire-proofing and slate; cost, $30,000 each; owner, Samuel Colcord, 400 West Seventy-ninth St.; architect, H. L. Harris, Ninth Ave., cor. Eightieth St.

Alterations.—*Cliff St.*, s e cor. Franklin St., six-st'y brick warehouse, interior alterations, etc.; cost, $8,000; owner, Joseph Hecht, 44 East Sixty-eighth St.; architects, Schwarzmann & Buchanan, *Tribune* Building.

West Nineteenth St., No. 361, three-st'y brick dwell., additions and alterations; cost, $2,800; owner, Edward Merrill, 361 West Nineteenth St.; architect, Jas. Stroud, 1267 Broadway.

West Twenty-third St., No. 69, four-st'y dwell. and saloon, brick front, additions and alterations; cost, $10,000; owner, Mrs. V. F. Mildeberger, H. M. W. Whitehead, attorney, 96 Broadway; architects, D. & J. Jardine, 1262 Broadway.

Philadelphia.

Building Permits.—*Frankford Ave.*, w s, s of Unity St., three-st'y brick and granite bank-building, 36′ x 90′; cost, $35,000; Geo. I. Pearson, architect; Wm. Steele, contractor.

Front St., cor. Somerset St., three-st'y bakery; cost, $7,000; Wm. Steele, contractor.

Palethorp St., n e cor. Huntingdon St., three-st'y factory, 40′ x 195′; cost, $40,000; W. H. Geissenger, architect.

Third St., cor. Cumberland St., three-st'y factory, 43′ x 66′; cost, $10,000; Wm. Steele, contractor.

Delaware Ave., n e cor. Moore St., two-st'y factory, 48′ x 113′ 6″; cost, $20,000; Baugh & Sons, owners.

Howard St., cor. Jefferson St., five-st'y factory, 40′ x 195′; cost, $34,000; Wm. Arrolt, owner.

Ninth St., e s, above Poplar St., one-st'y factory, 50′ x 100′; Bartholomew Brewing Co., owner.

Crescent St., cor. Davis St., 2 three-st'y dwells.; John Robinson, owner.

Lambert St., s of Dickerson St., 6 two-st'y dwells.; Wm. Elkins, owner.

Mascher St., No. 2010, ice-house and store-room; H. L. Lovett, contractor.

Fifth St., s of Butler St., 4 two-st'y dwells.; Duross & Welsh, contractors.

Fourth St., n of York St., 5 two-st'y dwells.; A. Hoffman, contractor.

Seybert St., w of Twenty-third St., 5 two-st'y dwells.; G. F. Gibbons, owner.

Boynton Ave., w of Wister St., 3 two-st'y dwells.; Jno. Rupp, contractor.

Lehigh Ave., w of Reese St., 5 two-st'y dwells.; J. S. Kelly, owner.

Fifty-fourth St., n of Haverford St., 3 two-st'y dwells.; Henry Schmid, owner.

Germantown Road, n of Huntingdon St., 2 three-st'y dwells.; Daniel Colamer, owner.

Canal St., n of George St., four-st'y factory, 32′ x 116′; Jos. McCartney, contractor.

Tasker St., w of Sixteenth St., 28 two-st'y dwells.; Andrew Miller, owner.

Ellsworth St., s of Broad St., 3 three-st'y dwells.; Andrew Conner, owner.

Delaware Ave., n w cor. Moore St., two-st'y factory-building, 48′ x 113′; Baugh & Sons, owners.

Main St., cor. Wakefield St., 4 three-st'y dwells., 17′ x 47′; B. L. Colemer, owner.

Nicetown St., 2 three-st'y oil-cloth factories, 20′ x 40′ and 36′ x 100′; G. W. Blabon, owner.

Sixth St., cor. Erie Ave., 8 two-st'y dwells., 17′ x 50′; A. Ruth, owner.

Frankford Ave., No. 3424, two-st'y dwell., 18′ x 36′; J. R. Morrow, contractor.

Amber St., n of Westmoreland St., 2 two-st'y dwells., 16′ x 40′, and two-st'y factory, 32′ x 40′; S. J. Kutz, contractor.

Howard St., s of Jefferson St., five-st'y factory, 50′ x 194′; Wm. Steele, contractor.

Frankford Ave., n of Church St., two-st'y factory, 36′ x 97′; Wm. Steele, contractor.

Union Ave., w of Germantown Ave., two-st'y stable; Wm. J. Mackee, contractor.

Auburn St., e of Frankford Road, two-st'y dwell.; Patterson & Marlin, contractors.

Mt. Pleasant Ave., 2 three-st'y dwells.; Martin Hetzel, owner.

Fairhill St., n of Cambria St., 2 two-st'y dwells.; T. Wohlfer, contractor.

South Fifth St., No. 1636, two-st'y dwell.; Geo. C. Jackson, owner.

Twenty-eighth St., n of Reed St., three-st'y dwell.; Wm. Galbraith, owner.

Indiana Ave., near Boudinot St., two-st'y dwell.; Jno. Anacker, contractor.

Fifth St., n of Huntingdon St., 2 three-st'y dwells.; Samuel J. Kutz, contractor.

Jefferson St., cor. Penn St., 2 two-st'y dwells.; Cox & Strickler, contractors.

Twenty-sixth St., near Huntingdon St., 2 two-st'y dwells.; J. H. Point, owner.

Carlisle St., n of Dauphin St., 5 two-st'y dwells.; L. A. White, owner.

St. Louis.

Building Permits. — Sixty-eight permits have been issued since our last report, twelve of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

John A. Smith, three-st'y brick dwell.; cost, $7,000; Weber & Co., contractors.

F. G. Nohl, 2 adjacent two-st'y brick tenements; cost, $4,500; W. C. Popp, contractor.

John Zimmerman, two-st'y brick dwell.; cost, $4,000; Louis Ainsley, contractor.

C. Peper, two-st'y brick addition to dwell.; cost, $3,260; Aug. A. Beinke, architect; Julius Martin, contractor.

S. Beauvais, two-st'y brick store and dwell.; cost, $3,500; J. H. Dunlap, contractor.

F. Gehner and F. Bruns, 2 adjacent two-st'y brick dwells.; cost, $2,500; Aug. Dicke, contractor.

L. Connery, two-st'y brick dwells.; cost, $3,000; John Costello, contractor.

James B. Conray, two-st'y brick dwell.; cost, $3,000; John Costello, contractor.

Henry Bolliverick, Sr., 2 adjacent two-st'y brick dwell.; cost, $5,000; John J. Sleffin, contractor.

Patrick McCann, 3 adjacent two-st'y brick tenements; cost, $5,500; Jos. Wise, contractor.

Mr. Gerstenkoon, 2 adjacent two-st'y brick stores and tenements; cost, $8,600; Henry Wanschaffe, contractor.

Geo. Kirgin, two-st'y brick dwell.; cost, $4,000; Geo. Kirgin, owner.

Mrs. E. Gerth, 3 adjacent two-st'y brick dwells.; cost, $8,000; D. Paulus, contractor.

C. H. Hammond, two-st'y brick dwell.; cost, $5,000; C. C. Helmers, architect; J. P. Rogers, contractor.

G. A. Campbell, two-st'y brick dwell.; cost, $3,000; James E. Gary, contractor.

N. R. Wall, two-st'y brick dwell.; cost, $3,000; S. C. Bulkley, architect; John Low, contractor.

Henry Klages, 2 adjacent two-st'y brick stores and dwells.; cost, $7,000; H. C. Brinkmeyer, contractor.

J. H. Posock, three-st'y brick factory; cost, $3,000; J. G. Doyle, contractor.

General Notes.

Cumberland Hill, R. I.—It is said that a new hotel capable of accommodating not less than 100 persons, will be built here in season for next season's business. It is probable that it will be erected on the site of the old hotel of E. L. Cook.

Fall River, Mass.—Work begun September 7 on the foundation of St. Louis Catholic Church, which is expected to be completed in one year.

Far Rockaway, L. I. — For Mr. Robert Hughes an hotel is to be built, 100′ x 225′, L shape, at a cost of $40,000; from plans of Mr. Jos M. Dunn, of New York, who has also designed houses for Messrs. J. A. Farresh, to cost $6,500; Geo. F. Boos, to cost $8,000; John Carney, to cost $6,000; and Jos. Marren to cost $5,000; also a club-house for Mr. Charles Cronin, to cost $15,000; and 2 cottages for Mr. Wm. A. Wynne, to cost $25,000.

Gilbertville, Mass.—James Stevenson is building a two-tenement house in the rear of Stevenson's Ave.

Jersey City, N. J. — The corner-stone of a new Polish Catholic Church in Jersey City was laid September 6, Bishop Wigger officiating, assisted by a number of clergymen. The edifice is to be at Sixth and Monmouth Sts., and will be a modest frame building of ample dimensions, to accommodate all the Poles in the city.

Laurel, Md.—Stephen Gamble, Esq., is to have built a two-st'y and attic frame dwell., 40′ x 65′, to cost $8,000; from designs by Frank E. Davis, architect, Baltimore.

Lenox, Mass.—The corner-stone of the new Trinity Episcopal Church was laid September 7.

Madison, Wis. — The Building Committee of the Board of State University Regents met September 1, and opened bids for the construction of the new science hall. Five were submitted, all of which the commission rejected on the score of being excessively high. The Commission then resolved to prosecute the erection of the building independent of a general contractor. Work will be commenced immediately, and the structure will cost $150,000 approximately.

Montpelier, Vt.—The Montpelier Library Building will be built at a cost of $32,300, and finished in one year.

New Bedford, Mass. — The Supervising Architect has approved the recommendation of Special Examiner Thayer that additional land be purchased for the federal building at New Bedford, Mass.

Norwich, Conn.—The will of Mrs. Maria E. Johnson leaves $50,000 for the incorporation of "A Home for Aged and Needy Women" in this city, upon the death of her neice, Mrs. T. J. McClenchen, of Guilford, Conn.

Pawtucket, R. I. — Stone & Carpenter, of Providence, are architects of the brick school-house to be built on Garden St.

Rockland, Me. — A meeting of citizens was held in City Hall September 7, to discuss the erection of a new depot nearer the business centre of the city. A committee was appointed to confer with the Directors of the Knox & Lincoln Road and present the case to them.

Seymour, O.—The laying of the corner-stone of Park School-House took place September 6.

Winona, Minn. — The St. Joseph's Catholic Church Society is having plans prepared for a new school building; also for a residence for the sisters, and a chapel. The building will occupy the site of the present buildings on Fifth St., and it is designed to construct it next spring. Its cost will be about $2,500.

Bids and Contracts.

Buffalo, N. Y. — The following is a synopsis of the bids for iron partitions, furring and lathing for the custom-house:—

John W. Hoyt, New York, N. Y., $4,111 and $3,900.

Haugh, Ketcham & Co., Indianapolis., Ind., $3,691.90.

H. C. Harrower, Buffalo, N. Y., $6,990.

Charles Szen, Buffalo, N. Y., $3,488.

Concord, N. H.—Bids were opened for the stone-work and brick masonry work on the new post-office and court-house as below. The lowest bidders are Mead, Mason & Co., who bid $20,000 for granite-work, and $22,000 for masonry. The other bidders on stone-work are: James Gillies & Son, New York, Middlesex (Ct.) sandstone, $64,750; Donagan & Davis, Concord, N. H. granite, $62,677; Granite Railway Co., $68,650; M. A. McGowan, Washington, D. C., Middlesex sandstone, $58,700; Sargent & Sullivan, Concord, N. H., granite, $62,460. The bidders on the brick masonry work are: L. R. Fellows & Son, Concord, N. H., $23,175; M. A. McGowan, Washington, D. C., $23,300; Ordway & Ferrin, Concord, N. H., $26,646; Staples Bros., Concord, N. H., $27,300; Legree & Phaneuf, Boston, $31,911.

Elmira, N. Y.—The contract for the construction of an addition to the State Reformatory, has been awarded to Swann & Murray of this city. Their bid was $102,000. Twenty-five firms put in bids, including Buffalo, New York, Philadelphia, and other parties, most of the bids ranging from $8,000 to $20,000 above that of Swann & Murray.

Erie, Pa.—The following is a synopsis of the bids for iron beams, columns, stands, etc., for first-st'y floor of court-house:—

T. H. Brooks, Cleveland, O., $1,250.
Dearborn Foundry Co., Chicago, Ill., $1,348.
Blake & Duffy, New York, N. Y., $1,519.
Henry Shenk, Erie, Pa., $1,553.
Phœnix Iron Co., Trenton, N. J., $1,750.
C. H. Kellogg, Buffalo, N. Y., $1,232.
L. M. Morris, Pittsburg, Pa., $1,413.
Marshall Foundry and Construction Co., Pittsburg, Pa., $1,500.
Snead & Co. Iron Works, Louisville, Ky., $1,600.

Passaic, N. J. — Bids for building the new public school were received by the Passaic Board of Education last evening. The proposals ranged from $26,589 to $34,888, exclusive of the heating, which amounts to $2,550. The contract was awarded to the lowest bidders.

Troy, N. Y. — A Pittsburg manufacturer has just signed a contract for building three furnaces for the Troy Steel and Iron Co. at a cost of over $700,000, the work to be finished December 31, 1886. There will be used in the construction of the new plant 3,350 tons of castings, wrought and plate iron; 3,500,000 fire bricks, and 3,500,000 red bricks. All the iron used in the construction of the buildings, and all the machinery will be made at New Castle.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 511.

OCTOBER 10, 1885.

Entered at the Post-Office at Boston as second-class matter.

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WE would like to call attention again to the approaching convention of the American Institute of Architects, which is to be held at Nashville, Tennessee, on the twenty-first and twenty-second of the present month. Nashville, although out of the way of most architects' travels, is really a very central point, and is easily reached from New York, Boston and Philadelphia, as well as from Chicago, Cincinnati and New Orleans. The people of the city, to judge from what the local journals say about it, seem to regard the visit of the Institute as something of a compliment, and will apparently do their best to make the time of their guests pass pleasantly. The Convention is to meet in the Senate Chamber of the State Capitol, and after the usual routine of business, followed in the afternoon by visits to the principal buildings of the town and vicinity, a reception is to be given to the members by the Nashville Art Association, upon whose invitation, indeed, the Convention is held in the city. On the afternoon of the second day a visit is to be made to a famous stock farm in the neighborhood, and a dinner in the evening, given by members of the Art Association and other citizens, concludes the pleasant programme. The business to be transacted by the Institute is this year of special importance. To say nothing of the new business which may be brought forward, committees were appointed last year to consider the subjects of competitions and protective associations, and the reports presented by these committees will undoubtedly be the subject of animated discussions, which, if we interpret correctly the indications of professional sentiment all over the country, will result in action of some kind. The Stockslager Bill for the supervision of public buildings will also, without doubt, be further considered, and some recommendation adopted which is likely to prove an important factor in determining the future of official architecture in this country. It is, we think, worth while to remind the older architects of the country, in particular, that while more important questions of professional practice are now to be decided than ever before, the Institute has perhaps never before been so prosperous and powerful; and as it is very likely to avail itself of opportunities for trying its strength, it is particularly important that the best experience and wisdom of the profession should be well represented in its counsels.

THE committee in charge of the Convention has arranged for rooms at the Maxwell House for as many members and others as may come, at the reduced rate of two dollars and a half a day; and reduced rates of transportation have been secured on several of the railroads entering Nashville. The regular fare from New York to Nashville is twenty-two dollars by way of the Pennsylvania Railroad, with four dollars extra for places in Pullman cars; but arrangements have been made for tickets to go and return from Cincinnati to Nashville at one-third more than the regular fare one way, and the Committee suggests that members from the North and East should buy tickets to Cincinnati, and avail themselves of the special return tickets from that place to Nashville. From Chicago to Nashville the regular fare is thirteen dollars and sixty-five cents. A special rate has been promised, but the particulars are not yet known.

NOVEMBER eighteenth, a little less than a month after the General Convention of the Institute, the Western Association of Architects holds its second Annual Convention at St. Louis. The committee of arrangements has not yet been able to complete its programme for the meeting, but we shall have the pleasure, in a later issue, of giving more definite particulars, and meanwhile we can confidently predict that the Convention will be a most successful one. Already, as we are told, favorable replies to the notification of the committee have been received from members in Minnesota, Missouri, Ohio, Nebraska, Indiana, Illinois, Wisconsin, Texas, Iowa, Michigan, New Mexico, Wyoming, Dakota, Louisiana, Kansas, Kentucky and Tennessee, and it is hoped that nearly five hundred architects will be present. The deliberations of such an assemblage of the most active and influential men in the profession cannot fail to be of the greatest interest to all who are privileged to take part in them, and it can hardly be doubted that the Convention will be able to do much for the advancement of professional interests. To judge from the list of subjects suggested by the committee for the papers to be read before the meeting, these will alone be of great value. We have not space to give the list at length, but it is sufficient to say that among the topics are Competitions, the Duties and Responsibilities of Superintendence, the Time Penalty in Contracts, the Relations of the Architect to Client, Contractor and Journeyman, the Legislation needed for the Protection of Architects, the Lien Laws, Government Aid to Students, Cheap Fireproofing, and Recent Improvements in Heating, Lighting and Ventilation, to show that the discussions are likely to embrace the gravest questions of our professional life.

WILLIAM PAGE, one of the most distinguished American artists of the last generation, died October 1, at his house at Tottenville, near the city of New York. Mr. Page was born in Albany in 1811, but was soon taken by his parents to New York, where he lived most of his life. He showed a talent for drawing when quite a boy, and at the age of fourteen began to study art in earnest, first as a pupil of Herring, the portrait painter, and afterwards of Professor Morse, who had a high reputation as an artist before his invention of the electric telegraph carried him away to shine among the great lights of American science. When barely twenty-one years old, he was admitted a member of the National Academy of Fine Arts, of which he became afterwards President. From this time his life was devoted to the practice of his profession, both in this country and in Italy, where he resided for three years. Most of his work was in portraiture, and the exhibition of a new portrait by Page was long a notable event in New York artistic life. While in Italy, he made a particular study of the technical processes of Titian, and believed that he had discovered the secret of the coloring of that great master, whom he certainly imitated with great skill. According to our imperfect recollection, Mr. Page's mode of coloring in the Titianesque manner was to spread his canvas with three successive coats of color, the first of which was black, the second red, and the last white. While these were yet soft, he worked upon them with his brush, bringing out the shades of his picture by stirring up some of the black substratum, deepening the flesh tints by bringing up the red, and softening and blending one tint into another in a surprising manner. The groundwork of his picture having been modelled thus, glazings and retouchings completed it, without destroying the luminous transparency gained by the preliminary process. Unfortunately, the colors of the pictures painted in this way have not, we believe, proved quite permanent, and many of them have lost their original quality. Among his best known portraits are those of Governor Marcy, Henry Ward Beecher, Charles A. Dana, and Parke Godwin. Of his more ambitious work, the ideal portrait of Christ, exhibited in 1870, is the best known, and was in its day the subject of much discussion.

M. MASPÉRO, who seems to have inherited much of the energy of his predecessor in the direction of the Goverment museum of Egypt, Mariette Bey, has recently made some excavations in the miserable village of Medinet-Habou, which covers the western part of the ancient city of Thebes. The first trench which was dug showed that a town of the Roman period had been built upon the ruins of the ancient Egyptian city. The Roman remains, except for being buried

in sand and mud, were in tolerably good preservation, and the condition in which they were found indicated that the town had been abandoned hastily, in consequence, perhaps, of an invasion. The first object of the Roman period found was a house, four stories high, built around a central court with arched entrance for carriages, much like those of Italian and Spanish houses of the present day. In the court was an exterior staircase, giving access to each story of the house. The rooms were of modest dimensions, averaging, according to *La Semaine des Constructeurs*, about fifteen by eighteen feet; but all of them were covered with flat barrel vaults in brick, levelled up and covered with a floor of palm leaves. The explorations had not, at the last accounts, been carried far enough to disclose anything more of special interest; but it is worth remarking that M. Maspéro, in anticipation of what is likely to be discovered, appeals for the aid of a professional architect, who could be of much use to him in noting details of construction, and would, as he says, be rewarded by an endless succession of curious discoveries.

ALTHOUGH the public has probably forgotten about the proposed competitive trial of electric motors for the New York Elevated Railroad, which excited so much interest a few months ago, it seems that a good deal of work has actually been done by one of the intending competitors, and an electric motor of the full size is now ready for use. According to an account in the New York *Tribune*, this motor has been subjected to various trials on the tracks of the Ninth Avenue line, late at night, after ordinary trains have stopped running, and has passed through them all in a very satisfactory manner. In the first experiments only one car was attached to the motor, Mr. Daft, the inventor, with his assistants, wishing to make as complete a test as possible of the behavior of the machine in use, but a week or so ago a train of four cars, which is the usual number on the Elevated roads, was attached to the motor, and was easily drawn over the line. Only half the full current was employed and the speed slackened at the steeper grades, but there seems to have been no question of the ability of the engine to draw the load. Aside from the merits of the electric system, as offering a means of moving the cars without annoyance either to passengers or to the inhabitants of the houses along the line by the suffocating gases which are now poured out from the smoke-stacks of the steam engine, the electric motor proves to be capable of drawing a far greater load, with a given weight on the driving wheel, than the steam locomotives. The engines at present in use weigh twenty tons each, and with heavily loaded trains behind them, have hardly hold enough on the track to prevent the slipping of the driving wheels in starting on the steep grades, while the electric motor, with a weight of only nine tons, clings in some way so tenaciously to the track as to move its load as readily as the much heavier steam machine. Whether the passage of the strong electric current from the rails to the wheels has anything to do with this adhesion is perhaps uncertain, although it seems probable, but whatever may be the explanation, the saving of ten tons in the weight of every train is likely to be a matter of considerable importance in its effect upon the cost of keeping such a structure as the Elevated road in good order.

AN improvement in the ordinary process for making sheet-lead has recently been made, which is hardly more than an adaptation of the ancient Chinese process for making the thin sheets of lead used for lining tea-chests. For a long time the process of preparing tea-lead was a mystery in Europe. No delicacy of manipulation would enable the rolls universally employed there for laminating lead to turn out such thin, even, perfect sheets as those which every Chinese tea-chest contained; and it was not until a score of years ago, or so, that some traveller happened to see Chinese workmen making the tea-lead, by the simple process of pouring melted lead on a flat stone, and then letting a second flat stone fall upon it. Of course, the stones were brought to great perfection of surface, and the lowering of the upper upon the lower one was skilfully regulated, but the principle of the manufacture could not well have been more simple. Within a year or two, according to the *Iron Age*, a German patent has been issued for a process of making sheet-lead with a hydraulic press, instead of the usual rolls, the lead being melted and poured out upon the expanded surface of the piston of a sort of compound hydraulic press. Above the piston is a stationery plate, and their movement is so controlled that they will approach at will to any given distance from the fixed plate. When the metal on the moving plate has cooled to the proper extent, water is turned into the cylinders of the press, and the lead is squeezed out into a thin sheet, of a size regulated by the dimensions of the plate.

A STRIKE took place not long ago in the workshop of Sir William Armstrong in England. There was no dissatisfaction on the part of the men with their treatment or wages; but one of the superintendents had offended some of them, and the whole body took this method of enforcing a demand for his removal. Sir William remained firm in his determination to resist the demand, and after two weeks of voluntary idleness his men, more than five thousand in number, took it into their heads to find out how many of them really had such an aversion to the unpopular superintendent that they could not work under him. A ballot was taken upon the question of giving up the point in dispute, and returning to their benches, and, out of nearly four thousand votes cast, only three hundred and forty-eight were in favor of continuing the strike. As the Philadelphia *Press* says, in commenting on the case, this result seems to indicate that ten per cent of the men, to avenge real or fancied grievances of their own, had thus been able to persuade the other ninety per cent to give up their work, and with it the support of their families, during two weeks, and might perhaps have driven them to extremities, if the idea of balloting on the subject had not fortunately occurred to some one. The *Press* is disposed to think that most strikes are devised and managed in the same way, by a minority, perhaps a very small one, of the total number of workmen concerned in the movement, who are able, by mere force of volubility and impudence to push or delude the others into disastrous follies. Against such errors the use of the secret ballot as introduced by the Newcastle workmen is a valuable safeguard. Men of limited education who pass their lives in routine mechanical occupations, think slowly, and are readily carried away by cheap enthusiasms which save them the labor of reflection; but the act of casting a secret individual ballot gives little scope for irrational enthusiasm, while it affords plenty of time to collect new ideas, and votes taken in that way usually represent sober conviction.

AN ingenious process for laying concrete under water was, according to *La Semaine des Constructeurs* recently, put in practice by M. Heude, the engineer of a railway bridge over the Loire in western France. The ground under the piers of the bridge was found to be very soft, so that in order to consolidate it, the first operation was to drive piles all over it, spaced about four feet from centres. To make a foundation for the stone-work it was necessary to spread a layer of concrete over the ground, but the piles, projecting in every direction from the mud, offered a serious obstacle to the placing of concrete in any of the usual ways. If the water had been quiescent, the concrete might have been thrown in, with tolerable prospect of success, but the current of the river would have washed the cement out of the concrete, and destroyed the adhesion of the successive portions, so that this process was, under the circumstances, inadmissible. The ordinary way would have been to sink caissons to the bottom of the stream, and lay the concrete inside them, removing them when it had become hard enough to resist the action of the water; but the piles presented an insuperable obstacle to the sinking of caissons. M. Heude therefore began by constructing a travelling crane, which, by means of timbers set so as to serve as tracks, could be moved in every direction over the site of the pier. To the boom of the crane he suspended a tube of plank, eighteen inches square, at the bottom of which was a rough valve, to prevent the entrance of a current of water. The tube was then lowered by means of the crane, until the bottom touched the bed of the river, the top projecting above the surface of the water, and filled with concrete, and the valve at the bottom was withdrawn. The concrete sank until it rested on the river bed, and the tube was then raised to a height equal to the thickness which it was desired to give to the concrete layer. The soft concrete of course ran out, but in a continuous mass, without the separation, which are apt to occur where successive deposits are made in water, and, by means of the crane, the tube was moved in and out among the piles, the material being continually replenished at the upper end, until the whole area was covered with a mass of concrete of the thickness desired. The precaution was taken of keeping the tube always filled with concrete above the water line, so that no entrance of water could take place to break the continuity of the mass; and the force of the current was somewhat checked by a row of sheet-piling above the scene of the work.

CHEMISTRY OF PIGMENTS.[1]



IT would be impossible, in the time at my disposal, to treat of every coloring material at present employed, even were I to devote myself solely to the consideration of such pigments as are used by artists in the finer departments of painting. I propose therefore, in the two lectures I am about to give, to take into consideration, firstly, some points with regard to the relation of color to the composition of the substances possessing these different colors; and, secondly, to pass under review some of the properties of the more common pigments, arranging them in the following classes, namely, (1) Whites, (2) Reds, (3) Yellows, (4) Greens, and (5) Blues.

With regard to the first question, namely, the relation of color to composition, it will be found that, on examining the majority of substances which evince the property of color, they may roughly be divided into two large classes — those substances which change their color under the application of heat or other circumstance, but retain still the same chemical composition after this change of color has taken place as they originally possessed; and those substances which in changing their colors also change their composition. Instances of the first class are to be found in the ordinary red pigment, vermilion, the change of color of which I can readily show you on the lecture table. In this boiling-tube I have formed from a salt of mercury the black variety of mercury sulphide (HgS), by precipitation with a polysulphide of ammonium. At first, as you see, the precipitate formed is black; but now, on boiling the contents of the tube for some time with an excess of the polysulphide, we find the color changed into a red color, comparable to a certain extent with the rich color of ordinary vermilion.

A similar instance of change of color without change of composition may be evinced to you in the case of another mercury salt, namely, the iodide of mercury, a body possessing, like one variety of the sulphide, a brilliant red color. I have here a sheet of paper spread with a small quantity of the red iodide; on gently warming this over the large burner, you see that it at once changes into a yellow color; this is the yellow variety of mercury iodide, and, so far as its chemical composition is concerned, is the same as the red body, viz., HgI_2. On drawing, however, a cross or line across this substance on the sheet of paper, and exercising some pressure upon it, you will at once perceive that the yellow variety is changed back into the red wherever the pressure has been exercised. This change of color, as many of you are aware, is probably due to a change in the crystalline form of the substance, but not in its chemical composition. Several other substances might be taken as instancing the same kind of phenomena, but I think that those cases which I have shown you are sufficient to illustrate that, in many cases, the color of the substance is quite independent of the composition, substances having an identical chemical composition, undergoing under different circumstances a change in color.

A large number of instances, however, may be found in the case of substances in which the change of color is found to be invariably accompanied by a change of composition. Instances of this kind may be seen in almost every class of colored bodies that we are acquainted with, and are especially to be remarked among colored metallic salts which contain differing quantities of water in their composition. The changes such bodies undergo in their color have been the subject of many investigations, the later ones carried out by Dr. J. H. Gladstone and Professors Hartley and Russell, who have examined very fully the spectra given by solutions of these salts under different conditions of hydration.

As instances of changes of this nature, we have the alteration in color which accompanies the heating of the blue crystals of copper sulphate. Here we have some crystals of this body contained in the retort before us, and which, at the present time, may be represented by the chemical formula, $CuSO_4\ 5H_2O$; when the temperature rises, a certain quantity of the water they contain is driven off, the material in the retort becoming converted into the body, $CuSO_4\ H_2O$; and, finally, if the temperature rises sufficiently high, into the substance, $CuSO_4$; or the anhydrous sulphate. At the same time, however, you will see, as the substance changes its composition, it also loses its bright blue color and distinct crystalline form. That the color of the body is, however, somewhat closely related to its composition, so far as the water is concerned, may be shown by adding water to the already decolorized body, when the blue color is restored, but not the crystalline form.

By far the most interesting cases with regard to such changes of color are to be found in certain of the salts of the metals nickel, cobalt and copper; and in the accompanying table, taken from a lecture of Prof. Hartley's, at the Royal Institution, you will see given the composition of some of these bodies, and the colors they give under the varying conditions.

Perhaps one of the most interesting salts to observe in this particular direction is cobalt iodide, an examination of which has shown that there are two distinct crystalline hydrates, the one formed at high temperatures having the formula $CoI_2\ 2H_2O$, and possessing a green color, and another, formed at a lower temperature, containing a much larger quantity of water, $CoI_2, 6H_2O$, having a brownish red color.

The formation of the dihydrate and the anhydrous black compound may be well shown by smearing, as I have already done, the bottom of this porcelain dish with a small quantity of the cobalt iodide, and gently heating over a Bunsen burner. You perceive immediately the almost colorless dish gradually showing a dark spot where the flame of the burner touches it, and as the heat increases, this spot becomes quite black, at the same time it appears surrounded with a ring of green color, outside of which you may see a second ring of a yellow color, this finally passing into one of a rose pink, the substance of which these rings are composed being the different hydrates of the cobalt iodide.

The formation of different hydrates of the same salt, each possessing its characteristic color, may be seen to very great advantage when we employ a mixture of the two salts, the bromide and iodide of cobalt. Thus, by painting a sketch of foliage and water with these two salts, as has been done for us here before lecture, and gently warming from time to time, most beautiful changes may be produced. At first it has the appearance of a warm sepia drawing, giving to the foliage a rich autumnal tint. On warming, however, the blue of the sky and water, and the exquisite green tint of summer foliage gradually appear, and by varying the quantity of cobalt iodide, colors varying between the delicate green of springtime and the full richness of summer may be produced. On removing now the picture from the source of heat, the atmospheric moisture reforms the original hexahydrated salts, and the brilliant colors gradually fade as the picture cools. In this case the stems of the trees have been painted with a small quantity of nickel bromide, which gives them, upon heating, a rich brown tint, contrasting very well with the green of the foliage.

SUBSTANCES VARYING IN COLOR, WITH THEIR STATE OF HYDRATION.

Anhydrous.	Compounds produced at 1000° C. from ordinary Crystals.	Ordinary Crystals.	Color of Solution.	
			Strong.	Dilute
$CuCl_2$ Yellow.............	$CuCl_2\ H_2O$...............	$CuCl_2 \cdot 2H_2O$ Blue.........	Grass green	
$CuBr_2$ Black and lustrous	$CuBr_2 \cdot H_2O$ Dark brown	$CuBr_2 \cdot 5H_2O$ Golden green	Red brown	Blue
$CoCl_2$ Lavender, blue when hot...............	$CoCl_2 \cdot 2H_2O$ Purple; blue when hot...............	$CoCl_2 \cdot 6H_2O$ Cherry red....	Deep Red...	Blue
$CoBr_2$ Vivid green........	$CoBr_2 \cdot 2H_2O$ Purple; blue when hot...............	$CoB_2 \cdot 6H_2O$ Deep crimson	Deep crimson..	Pink
CoI_2 Lustrous intense black.................	$CoI_2 \cdot 2H_2O$ Moss green	$CoI_2 \cdot 6H_2O$ Dusky red-brown............... ...	Dark brown	Pink
$NiBr_2$ Yellow............	($NiBr_2 \cdot H_2O$?) Dark red...	$NiBr_2 \cdot 3HO_2$ Green........	Madder brown..	Apple green
NiI_2 Lustrous intense black.................	($NiI_2 \cdot 2H_2O$?) Dark brown	$NiI_2 \cdot 6H_2O$ Bluish green	Yellowish brown..	Apple green

Passing now to the treatment of the special pigments which it is my wish to put before you, it is my intention to take instances from the different groups which I have already mentioned, and to take them into consideration in the order there given.

By far the most important of the white pigments is the one which is called "white lead," and which is essentially a mixture of the carbonate and hydrated oxide of lead in varying proportions. The preparation of a white resembling the body, prepared on the large scale, may be here illustrated to you by passing a current of carbon dioxide gas through a solution of basic acetate of lead, prepared by dissolving an excess of lead oxide in a solution of the normal lead acetate. In the apparatus on the table I pass the gas through two wash bottles, the first containing a solution of the normal acetate, and the second a solution of the basic salt, and you perceive that little or no white powder is formed in the first bottle, but a dense precipitation takes place in the second, consisting of lead carbonate. This process was adopted by Thenard in France; but the material formed, although pure and brilliant, did not possess that body required for painting purposes, and is not employed to such an extent as the paint prepared by the Dutch method.

[1] A lecture by J. M. Thomson, F. R. S. E., F. C. S., Demonstrator of Chemistry at King's College, delivered before the Society of Arts, and published in the *Journal* of the Society.

It would take too much time to enter fully into the details of the preparation of white lead upon the large scale, but as this color is one of great importance, I will indicate to you shortly the chemistry of its manufacture. Large gratings of metallic lead are prepared; these being piled or placed in earthen pots, are subjected to the action of the vapors of acetic acid, produced from vinegar placed in suitable vessels. At the same time, carbon dioxide gas is evolved from some material, such as spent tan. Under the influence of heat, the acetic acid volatilizes, forming on the surface of the lead a coating of basic lead acetate, which is decomposed in turn by the carbon dioxide, becoming converted into lead carbonate, and neutral acetate of lead; this latter, however, becomes rapidly reconverted by the oxygen of the air and a fresh portion of metallic lead into the basic acetate, which is again converted into fresh carbonate by an additional quantity of carbon dioxide. These reactions recurring a great number of times, gradually convert the bars of lead almost entirely into the mixture constituting the paint. This method is generally termed the Dutch method, and is largely carried out in Holland at the present time.

The manufacture of this paint was apparently known to the ancients, having been practiced at Rhodes, at Corinth, and in Lacedæmonia, afterwards passing to the Arabs, and successively to Venice, Holland, England and France.

The pigment sold in commerce is often adulterated, and should be examined for the sulphates of lead, barium and calcium, and also for calcium carbonate. For this purpose the oil with which the paint may be mixed must first be removed by successive extractions with benzol, and the powder dried on blotting paper. Pure white lead is soluble in dilute nitric acid, and a sample, when treated with this reagent, should pass entirely into solution, leaving no residue.

The chief drawback to all lead pigments, and especially to white lead, is the ease with which they are blackened by noxious gases, such as sulphuretted hydrogen gas, the sulphur in this gas uniting with the lead to form the black sulphide. In this jar I have some sheets of cardboard freshly covered with some of the paint, and you at once perceive the blackening action of the gas upon the paint when it is introduced into the chamber. This darkening action may to a certain extent, be removed by the action of oxidizing agents, such as hydrogen peroxide, which, acting on the lead sulphide, converts it into the white lead sulphate. To show you this action, I have here a piece of board with a cross of lead paint already blackened by the gas; I now brush this thoroughly with a moderately strong solution of the hydrogen peroxide, and you see very soon the gradual disappearance of the black sulphide. Many pictures which have become brown or colored from the formation of such a coating of sulphide may be gently washed with the peroxide, after the varnish has been carefully removed from them; this washing converts the lead sulphide into sulphate, which may be sponged off from the picture with warm water.

The advantage of white lead as a color depends upon the ease with which it may be spread over a large surface, and the depth of color or so-called body which the coating possesses. This is probably due to a certain saponification which takes place between the pigment and the oil with which it is mixed, giving to the coating, when first applied, considerable brilliancy. This brilliancy is, however, only temporary when the color has been applied over one of a darker shade, because the fatty acids contained in the oil gradually expel the carbonic acid from the paint, forming a clear lead soap, through which the deeper color gradually appears.

The next white color I would bring under your notice is the "zinc white," or zinc oxide, which is produced on the large scale by the combustion of zinc vapor in air, the oxygen of the air uniting with the zinc to form the oxide. The production of this body on the small scale may be readily shown to you by an experiment which I have here on the table. We have a tassel of zinc foil, tipped with a small wooden match, which I now light, and plunge the lighted tassel into this jar of oxygen, which has been prepared for me. You perceive at once how brilliant the combustion is, and after it has ceased we can collect and examine the product, which will be found to consist of a white powder of great brilliancy.

I will not enter into the details of the manufacture of this paint, but proceed to show you in what way it differs from the one we have already considered. When we examine the powder by itself, it seems just as brilliant, indeed, in some cases, more brilliant than white lead, but when we come to mix and spread the color, we find that it does not possess that density or opacity which belong to the lead pigment. It has, however, certain advantages over lead color, which, in many cases, overbalance its want of body, as it is not destroyed by noxious gases. The reason of this is that the sulphur compound which zinc forms is white in color, as I can readily show you by the following experiment. I have in this jar a little zinc white dissolved in acid, and the solution diluted with water; I now add some dilute ammonia solution to counteract the acid liquid, and you perceive that at first a white precipitate is formed: this dissolves, however, on the addition of slight excess of ammonia, and on passing some sulphuretted hydrogen gas through the liquid, we form a white body, the zinc sulphide, instead of the black substance we obtained in the case of the lead pigment.

Advantage has been taken of these properties in the manufacture of a form of zinc white called "Griffith's zinc white," which apparently has a brilliancy and body equalling the best forms of white lead. This pigment has for its basis zinc sulphide, this being accompanied by some magnesia in its precipitation. The mixed precipitate is dried, heated to a suitable temperature, and then suddenly cooled. In this jar I have placed some boards painted with zinc white, and you see that no blackening action takes place on admitting the sulphuretted hydrogen gas.

Zinc white may be adulterated with the same substance already mentioned under white lead. If perfectly pure, the oxide should dissolve entirely in dilute sulphuric acid, but if impure, a white residue will be left.

Other white pigments of somewhat lesser importance are prepared. Among these may be mentioned "whitening," or Spanish white, which is prepared by grinding native chalk, or precipitating calcium carbonate; barium sulphate, manufactured in France on the large scale under the name of *blanc fixe*, either by grinding native heavy spar, or by precipitating the sulphate with sulphuric acid from a solution of barium chloride. The pigment so prepared is entirely unacted upon by gases containing sulphur, and so undergoes no blackening action; but, like zinc white, it does not possess the body or covering power which is given by white lead. It is, however, employed to a large extent in distemper painting, and, as already stated, is used for the adulteration of white lead and zinc white. A very brilliant white may be obtained from another compound of barium, namely, barium tungstate, which may be prepared by precipitation from a soluble barium salt with an alkaline tungstate. I have here a specimen of this white so prepared, and you perceive how extremely brilliant the white is. It suffers, however, from the same fault as the barium sulphate and zinc white, and does not seem to have found much favor with artists. The metals tin, mercury, antimony and bismuth also yield white pigments, but they possess no advantage over white lead, and are all blackened more or less by sulphuretted hydrogen gas.

Red Pigments.—I pass now to the consideration of certain of these pigments, firstly, on account of one of the most important of them, namely, red lead, containing the metal lead which we have already found in other pigments; and secondly, because I will consider the remaining colors according to the order in which they are arranged in the solar spectrum. Red lead consists of an oxide of lead, the chemical formula of which is approximately Pb_3O_4. It is largely used for out-door painting of a coarser kind, but is very little employed by artists, as it has no permanency, and is particularly easily affected by noxious gases. It is prepared by heating "litharge," another oxide of lead, to the required temperature in reverberatory furnaces, great care being taken that the litharge is pure, and the temperature well regulated, so as to obtain the richest color, the presence of other metals greatly deteriorating the brilliancy.

Red lead is probably a mixture of two oxides, PbO and Pb_2O_3, as we find that treating it with warm nitric acid produces at once a change in the color, by dissolving out the first or protoxide, and leaving the brown peroxide. You will perceive this change on the sample I have in this tube, which rapidly becomes brown on my adding to it a little warm nitric acid.

Vermilions.—Common Vermilion, Mercury Sulphide; and Antimony Vermilion, Antimony Sulphide. — The first of these colors I have already alluded to in the commencement of my lecture, in connection with change of color without change of composition. We have now to consider more particularly its manufacture as a pigment.

The mercury vermilion may be obtained either by the sublimation of a black compound of mercury and sulphur at a high temperature, or by the wet method, which is the one supposed to be adopted by the Chinese in the preparation of the peculiarly rich color which they obtain. For the first method, the sublimation of the black powder, or "Ethiops," as it is called, is carried out in specially formed earthern pots, heated at the bottom, and carefully cooled at the top, so that the sublimed sulphide may be deposited on the cooled part of the vessel. The best portions of the sublimate are then picked out, washed and crushed for sale. In Idria the mercury and sulphur are placed in barrels, which are caused to revolve rapidly, until the entire combination of the bodies has taken place. This forms the black sulphide, which is then placed in iron cylinders heated to dull redness, and fitted with earthern covers and tubes, in which the red variety is deposited. After finely grinding the pigment in water, it is boiled with caustic alkali to remove the excess of sulphur, subsequently being washed and dried.

In the so-called Chinese or moist method, the mercury and sulphur are ground together, then moistened with a small quantity of caustic potash; having been well mixed, more solution of caustic potash is added, and the whole heated on a sand bath, with constant stirring, the heat being gradually and carefully increased, the temperature which seems to yield the best results being a little below 50° C. At a certain point the mixture attains its most brilliant color, becoming gelatinous in consistency; the operation is then stopped, the vermilion washed with caustic soda and water, and finally dried. In both operations the success depends chiefly on the management of the temperature in the sublimation of the Ethiops, and in the heating of the caustic lye with the mercury and sulphur.

Vermilion may be found adulterated with several substances, chief among which are brick dust, and the chromate and peroxide of lead. Samples of the pigment may be tested for brick dust by simply volatilizing some, as I do now, on a piece of porcelain, when the pigment passes off, leaving the brick dust behind. To detect chromate or peroxide of lead, the pigment should be digested with hydrochloric acid, when the smell of chlorine will at once be felt; and should

further proof be required, the mixture may be filtered hot, when the lead salt will most probably be deposited in the filtrate, on cooling. Should vermilion be adulterated only with lead chromate, very often friction in a mortar is sufficient to show its presence, as a deterioration in the brilliancy of the pigment takes place.

There seems to be no doubt that vermilion, unless exceptionally pure, undergoes a change through time, gradually losing its original bright red color, and becoming converted into a brown. This may be explained when we reflect that the great brilliancy of the color can only be obtained by carrying out its preparation within certain temperatures, and that heating above or cooling below these points does not yield a good color, pointing to the fact that the pigment cannot be regarded as a perfectly stable body, but is liable to molecular changes which may take place through time or changes of temperature.

Antimony Vermilion, Antimony Sulphide.—This color may be prepared by passing a current of sulphuretted hydrogen gas through a solution of some antimony salt acidulated with hydrochloric acid, when you see the orange precipitate of antimony sulphide forming.

To prepare the precipitate of a good scarlet hue, pure antimony chloride should be dissolved in water, when at first a white precipitate of antimony oxychloride will be found; on adding a saturated solution of sodium hyposulphate, or calcium hyposulphate, to this mixture, however, the precipitate will quickly dissolve, and on heating the vessel gently to about 30° C, a precipitate will be formed, at first of an orange color, but gradually changing to a brilliant scarlet. The best result is obtained when the temperature is gradually raised to 55° C, when the reaction should be finished if a sufficient quantity of the hyposulphite has been used. After preparation the pigment should be thoroughly washed, when it will be found to stand well, and, already containing sulphur, is not affected by noxious gases.

A red of an extremely brilliant color, named "iodine scarlet," may be obtained from another compound of mercury, namely, the biniodide. Its formation can easily be shown to you on the lecture-table by adding together solutions of potassium iodide and mercury bichloride, when a brilliant scarlet color is produced. This substance is soluble in excess of either reagent, and the addition of these must be carefully carried out; the best result being obtained by taking eight parts of mercury bichloride to ten parts of the potassium iodide. Although a color of great brilliancy, it cannot be recommended, as the mercury biniodide undergoes transformation by heat, as already shown to you, and the color does not withstand the action of sulphuretted hydrogen gas.

Two other compounds furnish pigments of a rich color termed "purple red." They are the chromates of mercury and silver, and are formed by the decomposition of the nitrates of silver and mercury by potassium bichromate. The cost of such pigments, however, and the fact that they gradually lose their brilliancy, in time, has prevented their extensive employment. The silver chromate was at one time much used in miniature painting.

"*Colcothar or English Rouge*" is a residue of iron peroxide produced in the manufacture of Nordhausen sulphuric acid, and resulting from the decomposition of the iron protosulphate therein employed. If required in a finer condition it may be prepared either by carefully heating pure anhydrous ferrous sulphate, or by roasting precipitated ferric oxide. This pigment is not unfrequently adulterated with barium sulphate, which may be readily recognized by treating with hydrochloric acid, which entirely dissolves the colcothar, leaving the sulphate unacted upon.

Yellow Pigments.—Ochres.—These pigments consist essentially of clay, colored with different quantities of ferric oxide, with more or less water attached to it. They comprehend also the colors "raw" and "burnt sienna," and the pigments known under the names of "Antwerp" and "Venice reds." The darker shades of ochre are readily prepared by heating the bodies of a lighter color, and contain lesser quantities of water in their composition. I have here some yellow ochre in this tube, and you perceive that at once, on the application of heat, it becomes brownish-red in color, losing water, which collects on the colder portions of the tubes. The ochres, as a class, are of no definite chemical composition, but they are extremely stable colors, both under the action of air and noxious gases, and are well suited for outdoor painting.

Chromes.—Next to the ochres, the most important group of yellow pigments are the chromes, which are produced by the combination of chromium, in the condition of chromic acid, with the metals lead, zinc, barium, strontium or calcium. They are divided into two large classes, namely, "yellow" and "orange" chromes, and I must content myself with showing you generally how these different conditions are attained, without entering into the details of their special preparation. The yellow chromes may be obtained by the precipitation of a salt of the metal from which the chrome is required, with neutral potassium chromate, as you see on the table before you. In this jar I have a solution of barium nitrate, which, on the addition of a solution of potassium chromate, yields us a brilliant yellow precipitate of barium chromate. In the same way the lead chromate may be prepared and obtained as a yellow powder of considerable brilliancy and density. The chrome which we have here produced is what is technically termed "lemon chrome," but by mixing this with some other white pigment a lighter shade may be made. This is generally done by mixing with lead sulphate, and we must not, in such a mixture, regard the sulphate of lead added as placed there for the purpose of adulteration, but only as a diluent to the chrome color. The chromates of barium, zinc, strontium and calcium all possess shades comparable with that of the lemon chrome.

Orange Chromes.—These pigments consist of the basic lead chromate obtained by slight differences in the method of preparation, and are generally formed by boiling the neutral chromate with caustic alkali, by which means the chromate associated with an additional quantity of lead oxide is produced. The formation of a simple orange chrome can be easily shown to you by boiling, as I now do, a little of the lemon chrome with caustic lime. You see that, as the temperature rises, a darkening in color takes place, which may be increased at will by still farther heating. If we regard the neutral lead chromate as possessing the chemical composition $PbCrO_4$, the orange chrome formed from it would have the composition ($PbCrO_4$. PbO), and will evidently be produced by processes of oxidation. In fact, one of the methods adopted for its preparation, namely, that one in which it is formed by adding the neutral chromate to ordinary nitre in a red-hot crucible, depends on this property.

The objection to the chromes as pigments depends on the action of alkalies upon them, which, as we have seen, produce this darkening effect, and if in excess, exercise a solvent action on the substance. The colors, of course, formed by lead chromate are subject to the same action of sulphuretted hydrogen gas as other lead pigments. Processes of reduction also affect the chromes, giving to them a slight green tint; such a reduction being produced by organic substances with which the color may be mixed. I have here a small quantity of lemon chrome, which I mix in this tube with a little strong hydrochloric acid and alcohol, when you perceive that, on boiling, the color rapidly changes, the chromate being dissolved, and, finally, the mixture changing to a green color, this reduction being produced by the alcohol. The admixture of other bodies with the chromate of lead, such as calcium, or lead sulphates, does not seem to interfere with the color unless carried to too great an extent, as is done in the case of "Cologne yellow," which contains a large admixture of these two bodies.

Before leaving the yellow pigments yielded to us by lead, there is one substance which might be mentioned, from the brilliancy of its color, but which is not to be recommended as a durable pigment: that is, the lead iodide. This substance is formed by bringing together solutions of lead nitrate and potassium iodide, when we obtain a beautiful canary-colored precipitate of considerable body. This pigment, however, apart from its decomposition with noxious gases, is easily soluble in hot water, becoming converted into a crystalline variety, which is deposited in that condition on cooling. Other yellow colors containing lead are found in the pigments formed from Massicot (PbO), and in "Turner's yellow," which is apparently an oxychloride of lead.

I now come to two yellow pigments which are definite in their composition, and in one case permanent in color; these are yellow orpiment, or "king's yellow," and "cadmium yellow," the first of these being a sulphide of arsenic, the second sulphide of cadmium.

King's Yellow may be formed by subliming together flowers of sulphur and arsenious acid, or by making a solution of arsenious acid in water acidulated with hydrochloric acid, and passing a current of sulphuretted hydrogen through the solution. The pigment obtained in both cases has the arsenic tersulphide for its basis, but the body prepared by sublimation generally contains small quantities of free arsenious acid. King's yellow forms but a poor pigment without much durability, and when containing free arsenious acid is poisonous. Another yellow may be formed from arsenic by fusing together litharge (lead oxide) and arsenious acid, and is sold under the name of "mineral and arsenic yellow." The fused mass must be thoroughly ground to secure perfect homogenity of the pigment.

Cadmium Yellow.—Sulphide of cadmium prepared in a manner similar to that indicated for King's yellow may, I think, be regarded as one of the most permanent of the yellow pigments. It mixes well with other colors, and, as it is not easily decomposed, has no tendency to deteriorate lead pigments. It may be obtained in different shades, according to the proportions in which the ingredients forming it are taken, this constituting a little difficulty in its preparation for the trade. You can readily judge of the ease with which it may be obtained, by my adding some sulphuretted hydrogen to this large vessel of water, containing a little of a salt of cadmium, when a brilliant yellow precipitate of cadmium sulphide is obtained. The last yellow pigment to which I would specially draw your attention is the one which is sold under the name "Aureolin." It is a somewhat complex compound, produced by the precipitation of a salt of the metal cobalt with potassium nitrite, when the solution is strongly acid with acetic acid. In this flask I have such a solution of cobalt sulphate rendered acid with acetic acid; to this I now add excess of potassium nitrite. At first no precipitate is seen, but on standing, a brilliant yellow powder, consisting probably of the double potassium and cobalt nitrite, begins to be formed, this increasing on the mixture being allowed to stand. This pigment, when prepared in a pure condition, is strongly to be recommended, as it is entirely unacted upon by gases containing sulphur, and, when in a pure condition, withstands the action of weak alkalies.

Various other bodies yield us yellow pigments of greater or less brilliancy and durability, such as Turner's yellow and the yellows sold under the names of Cassel, Montpelier, and Verona yellows,

which are all oxychlorides of lead. They are not worthy of special notice, and I will therefore content myself with merely mentioning them.

In my next lecture I propose to take up the consideration of certain pigments yielding us green and blue colors.

The following tables give some of the more common pigments, arranged in groups according to their more or less poisonous properties: —

FIRST GROUP.

PIGMENTS DANGEROUS TO HEALTH.

Orpiment (arsenic sulphide.)	Minium.
Realgar.	Naples yellow (lead antimoniate).
Mercury biniodide.	Lead oxychloride.
Turbith mineral.	Lead sulphate.
Lead arsenite.	Cobalt arseniate.
White lead.	Verdigris (copper acetate).
Massicot.	Scheele's green (copper arseniate).
Litharge.	Prussian blue.
Prussian green.	

SECOND GROUP.

PIGMENTS LESS DANGEROUS TO HEALTH.

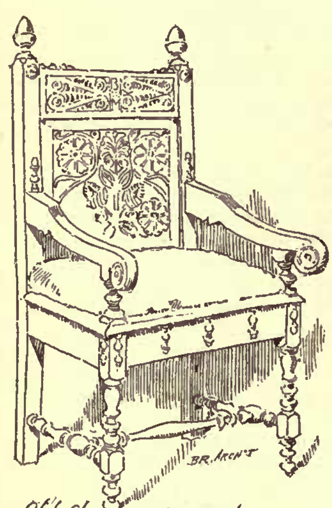
Lead chromate.	Zinc oxide.
Vermilion.	Zinc chromate.
Tin sulphide.	Barium chromate.
Mineral lake (tin chromate).	Antimony oxychloride.
Copper chromate.	Cadmium sulphide.
Purple red.	Smalt.
Thenard's blue.	Ultramarine.

THIRD GROUP.

NON-POISONOUS PIGMENTS.

Carbonate of lime.	Burnt umber.
Barium sulphate.	Raw sienna.
Yellow and red ochre.	Burnt sienna.
Venetian red.	Cologne or Cassel earth.
Mars red.	Sepia.
Cochineal or carmine.	Ivory and lamp blacks.
Manganese brown.	Indian ink.
Vandyke brown.	Colcothar.
Raw umber.	Indigo.
Terre verte.	

THE SEA-DEFENCE WORKS AT HOVE.



Old Chair of Church, Great Budworth. Eng.

THESE works, having now been in progress for five years, are so far completed that the east foreshore, where the encroachments of the sea were greater than at any other point, may be said to be permanently protected. The works at Hove commenced as far back as September, 1880, and have involved an expenditure of upwards of £60,000, two-thirds of which sum has been expended by the Hove commissioners, the remainder having been the cost of the works constructed by the West Brighton Estate Company and other owners of property.

Up to January, 1880, the Hove foreshore had for many years gradually received such accretions of shingle naturally as to form a complete barrier to the action of the sea; but about the time named, the effects of the pier extension at Shoreham Harbor became so apparent that the Commissioners' engineer, Mr. Ellice-Clark, advised the construction of groynes. These works were pushed on with, but towards the end of 1882 the encroachments had become so serious that it was clear groynes alone would not serve to protect the large expanse of lawns abutting on the sea at Brunswick Terrace. The supply of shingle, which naturally comes from the west, had practically ceased, owing largely to the projection of the Shoreham Harbor west pier, and to the extensive erection of groynes between Bognor and Hove. This being so, and the destruction of the west portion of the lawns being imminent, Mr. Ellice-Clark advised the erection of a sea-wall at the most dangerous place, as a first instalment of this mode of protection, to be ultimately continued along the entire front, about one mile and a quarter.

The Commissioners having then expended nearly £10,000 on the works, determined to fortify themselves with a second opinion, and consulted Sir John Coode, with a view to his reporting on the whole question of the sea defences, the result being that this eminent authority advised the immediate erection of the wall along the lawns, a distance of about seven hundred and twenty yards. Consequently, in 1882, this scheme was let by tender to Messrs. Hill & Co., of Gosport, and in March, 1884, the first concrete block was laid, in the presence of the Municipal Engineers' Association. The extraordinary summer of 1884, coupled with the great energy of the contractors, enabled the work to proceed with such rapidity that previously to the equinoctial gales in October of the same year, the wall, as a sea defence, was practically completed.

The wall is, for the most part, twenty-four feet in height above the foundations; it is eight feet six inches in width at the base, and three feet wide at the top, having counterforts every twelve feet six inches in length and four feet six inches in depth. The outer part of the wall consists of concrete blocks, faced with large land flints set in neat cement. It may be here stated that the number of blocks made and fixed *in situ* during the summer of 1884 exceeded thirty-five thousand. The entire wall is coped with a bold Cornish granite coping, two feet six inches in width, and about two feet average depth. The foreshore is approached by two inclines of one in eight, and four flights of steps, all in Cornish granite. In front of the wall there are five timber and three concrete groynes, each extending from the face a distance of two hundred and ten feet into the sea. Owing to the great impoverishment of the foreshore, the engineers adopted the novel expedient of artificially replacing the shingle removed by the scour of the sea. Twenty thousand feet of beach have been dropped on to the foreshore from hopper barges. This work has been attended with the best results, the wall having now a considerable bank of shingle in front of it, where, fifteen months ago, the denudation had bared it to within four feet of the underside of the foundation. This rapid natural withdrawal of the shingle during the progress of the work caused the engineers considerable uneasiness; but their resources were equal to the difficult position so rapidly set up. For while the artificial deposit of shingle was proceeding at the barest places, sheet-piling was driven in front of the wall, and a large number of faggots was employed. The work proceeded night and day without intermission for three months, so that by the time the heavy winter gales set in the work was completed. Within a very short time after its completion a very heavy southwest gale on the top of a spring tide put the new work to a most severe test, with the result that though the waves reached a height of forty feet, when they broke on the face of the wall not a stone was disturbed.

The work projects seawards a distance of thirty yards from the original margin of the lawns. The desire of the engineers to execute such a bold scheme was the subject of much angry controversy at the time, but fortunately the plans were adopted in their entirety with the result that the Hove people have, as a first instalment of the works, a promenade nearly half a mile in length and thirty yards wide. The great success of the work is borne testimony to by the Brighton public, who frequent the wall in large numbers.

In the course of a few weeks the promenade will be protected by a substantial ornamental fence, which is now being founded by Messrs. Reed & Son, of Brighton. As before stated, the engineers are Sir John Coode and Mr. Ellice-Clark. The contractors were Messrs. W. Hill & Co., of Gosport, to whose energy in completing the works with such rapidity the greatest praise is due. — *The Builder.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR A MONUMENT TO GENERAL GRANT.

THE publication of this design is made desirable by the *réclame* which was addressed to us, and which is published in another column.

THE CATHEDRAL OF S. MARTINO, LUCCA, ITALY.

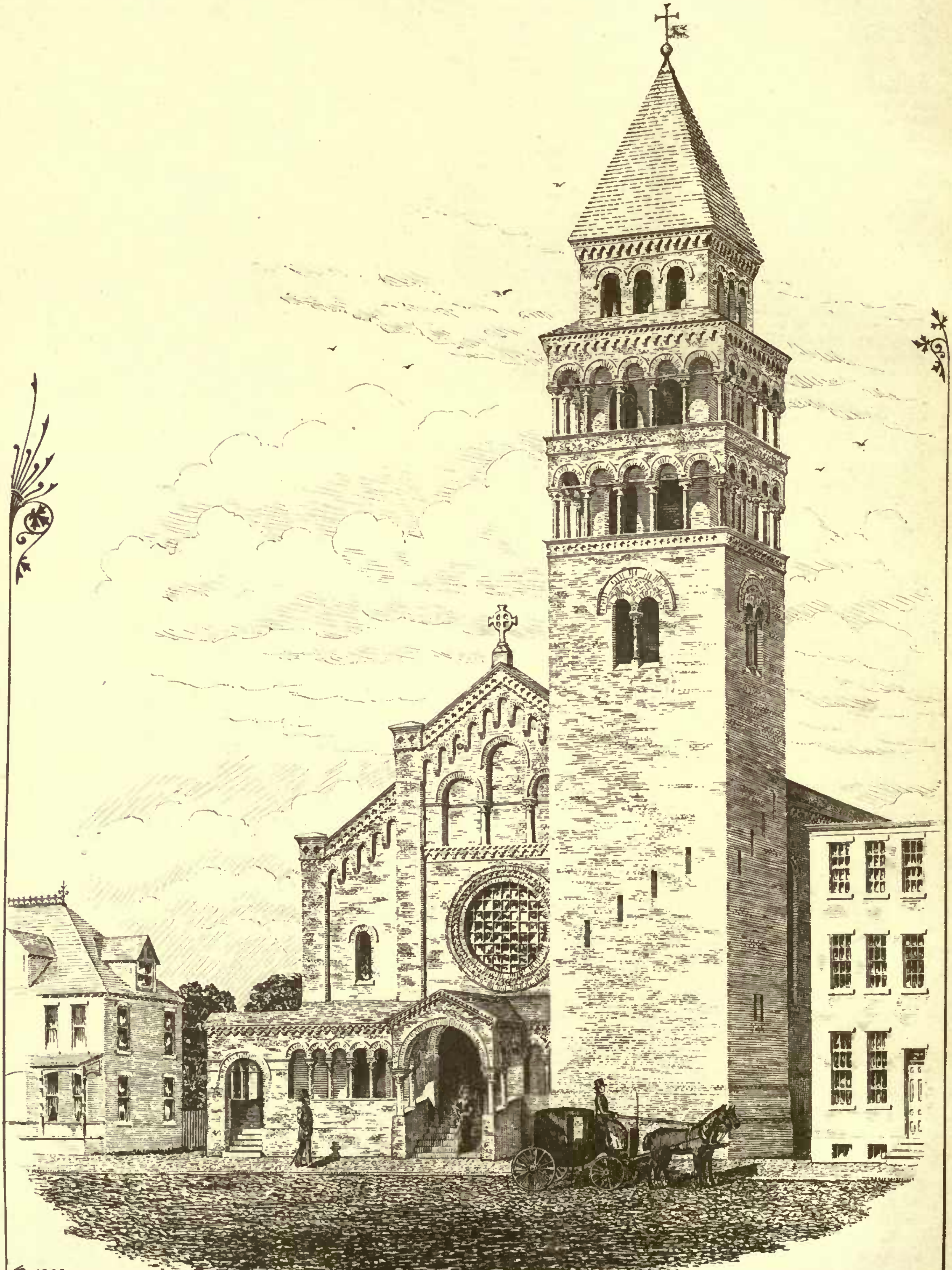
THIS building most famed for its façade, designed by Guidetto in 1204, was built between 1060–1070.

ST. STEPHENS' CHURCH, WILKES BARRE, PA. MR. C. M. BURNS, JR., ARCHITECT, PHILADELPHIA, PA.

PRESBYTERIAN CHURCH AT FOX CHASE, NEAR PHILADELPHIA, PA. MR. T. P. CHANDLER, JR., ARCHITECT, PHILADELPHIA, PA.

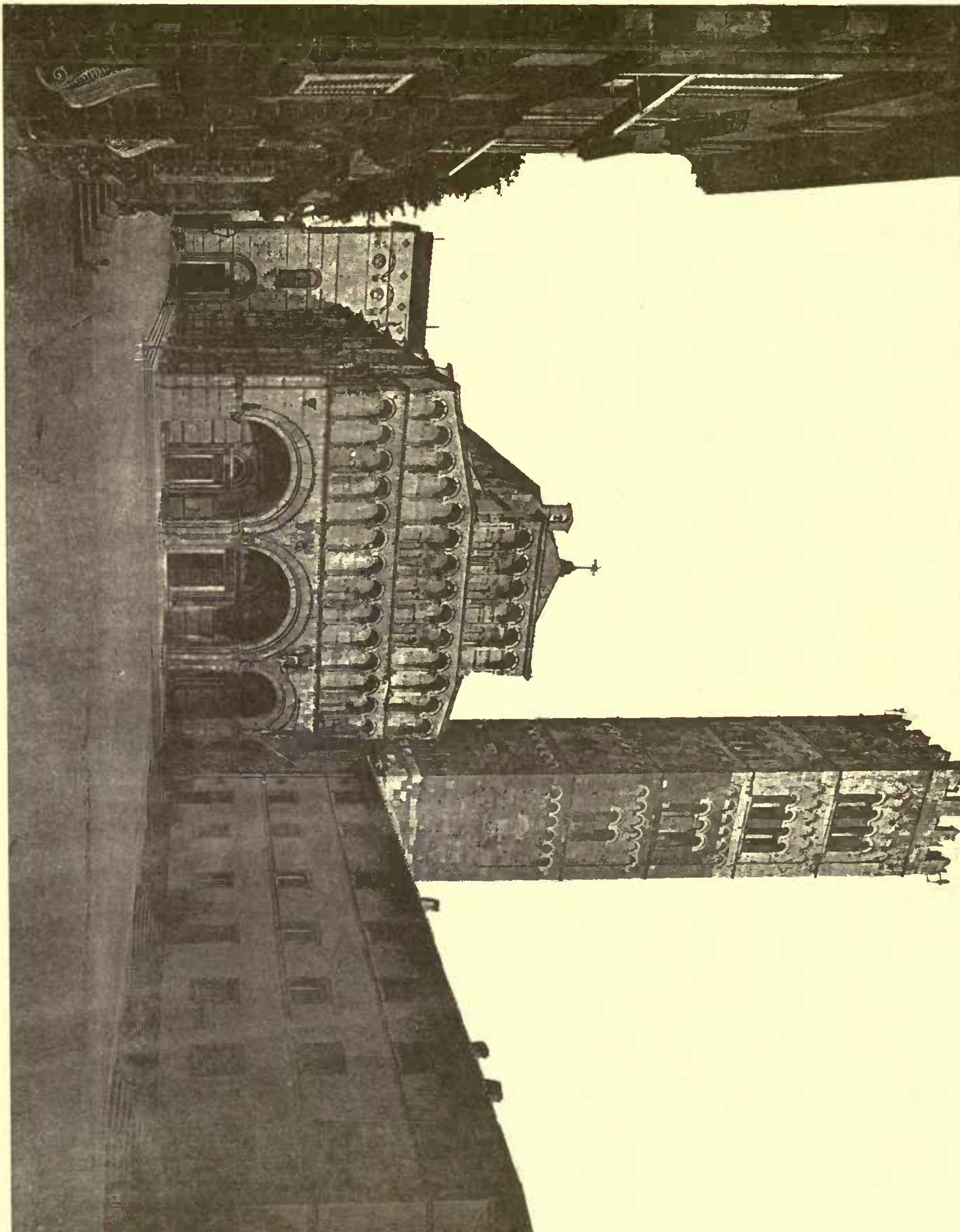
CLOISTERS OF ST. JOHN LATERAN, ROME, ITALY.

AN INSTANCE OF THE FOULING OF WELLS.—In a paper read before the Kentucky State Board of Health, J. N. McCormack, M.D., gave the following forcible and instructive instance of the fouling of wells from a source above their level, which he quoted from the report of Mr. Child, officer of health for certain districts in Oxfordshire, England: "In consequence of the escape of the contents of a barrel of petroleum or benzoline which had been buried in an orchard, a circuit of wells sixty feet below, and two hundred and fifty or three hundred yards distant, became so affected that the occupiers of fifteen houses, containing eighty-two inhabitants, were for ten days unable to use the water for drinking or cooking. The cattle of one of the proprietors, moreover, refused to drink at the spring where they were accustomed to drink. Had this soakage been sewage, instead of petroleum, who can doubt that the result might have been wholesale water poisoning and an outbreak of typhoid fever?"



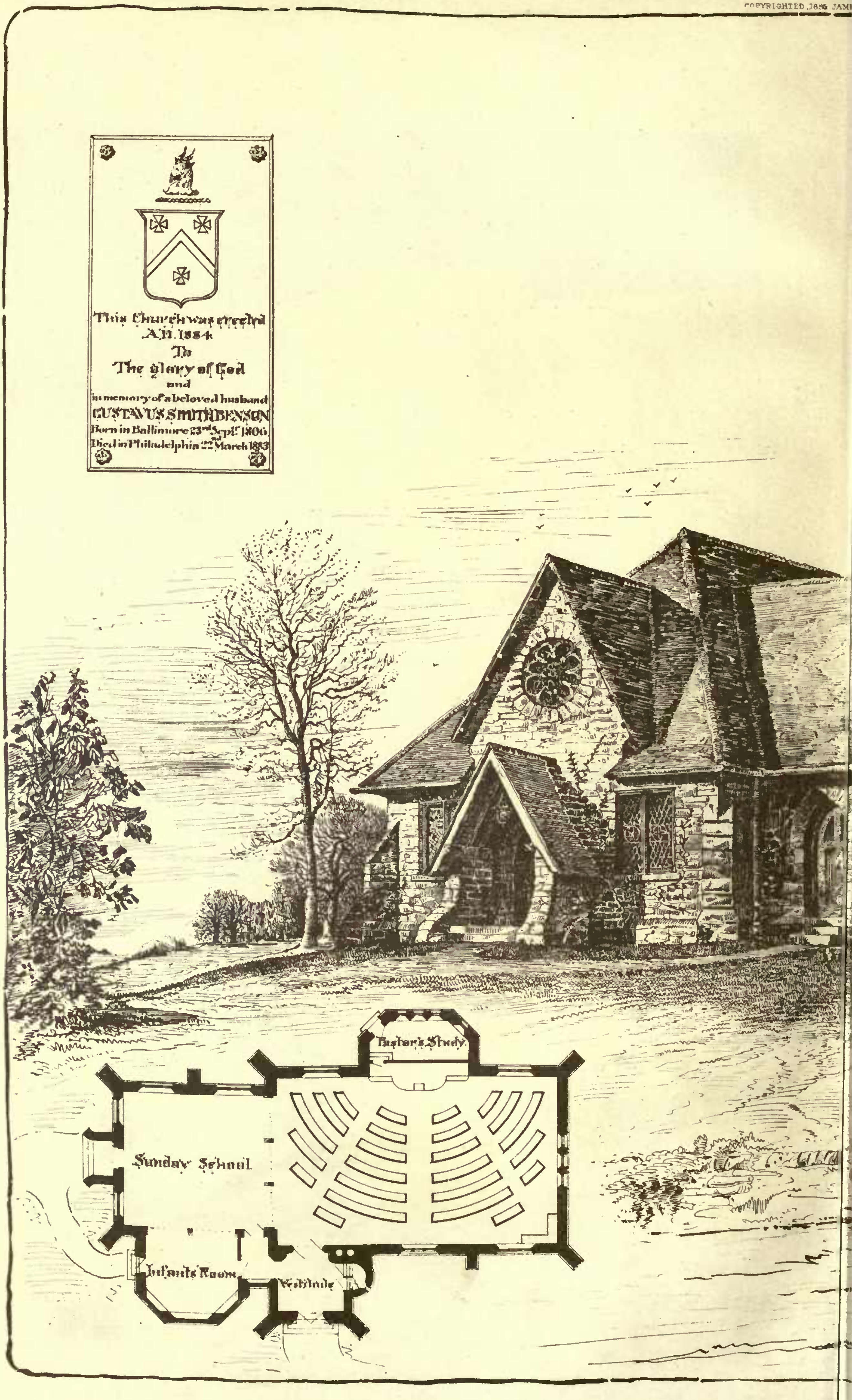
S. STEPHEN'S CHURCH, WILKESBARRE, PA.
CHARLES M. BURNS JR. ARCHITECT. PHILA.

HELIOTYPE PRINTING CO. BOSTON



Cathedral of S. Martino, Lucca, Italy.

HELIOTYPE PRINTING CO BOSTON

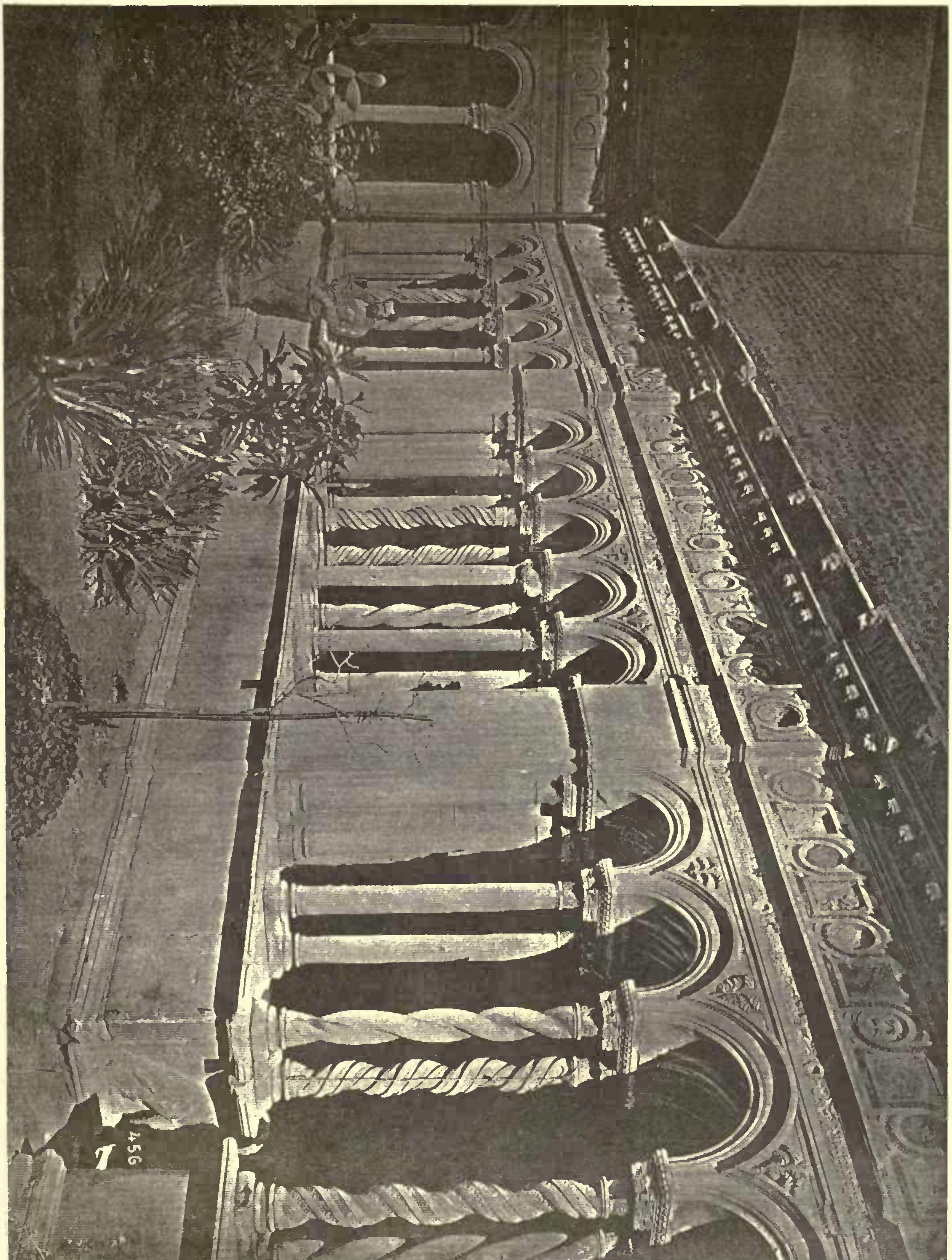

This Church was erected
A.D. 1884
To
The glory of God
and
in memory of a beloved husband
GUSTAVUS SMITH BENSON
Born in Baltimore 23rd Sept. 1806
Died in Philadelphia 22nd March 1883
Pastor's Study
Sunday School
Infants Room
Vestibule

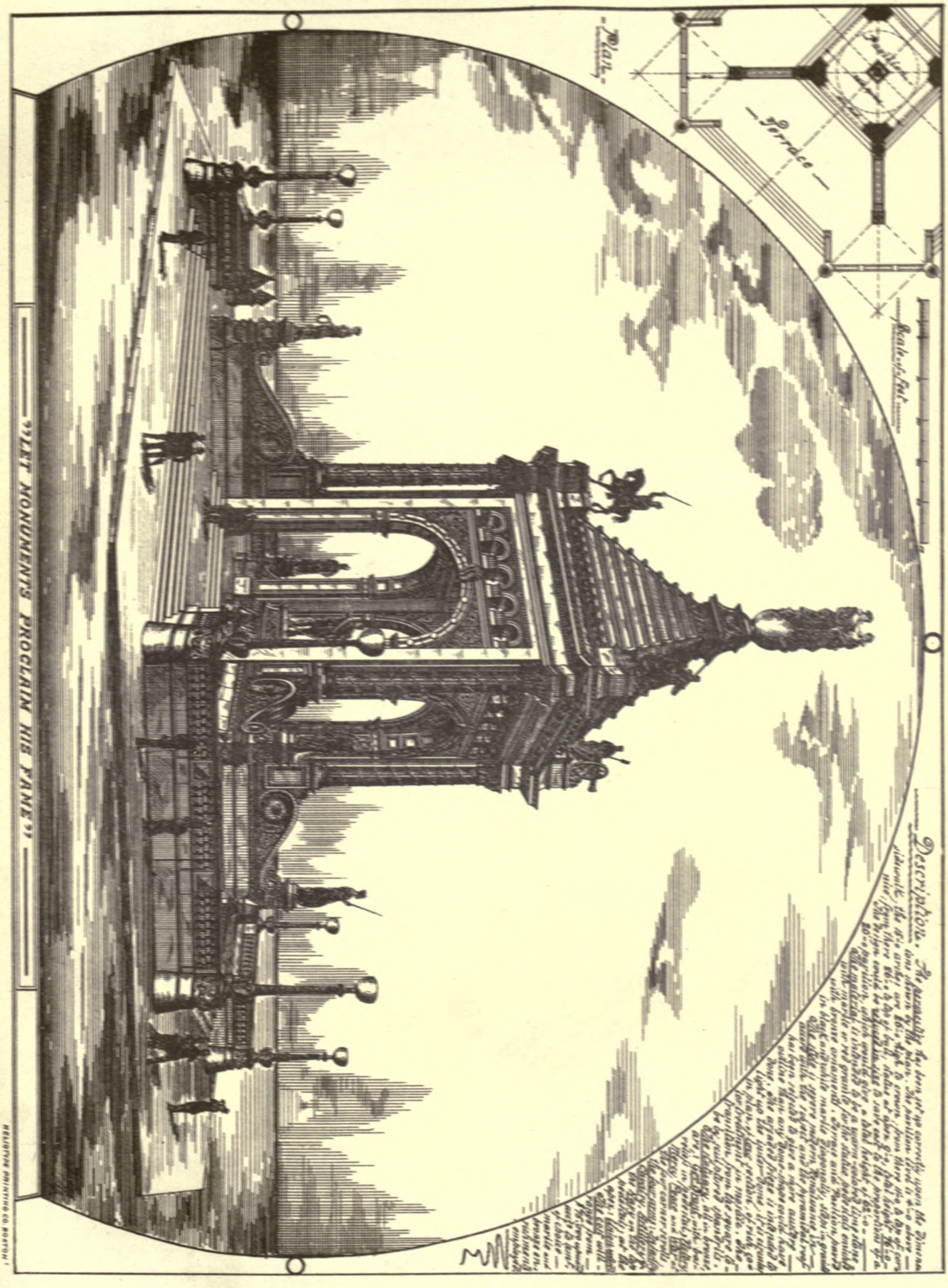


PRESBYTERIAN CHURCH AT FOX CHASE.
Near Philadelphia. Pa.

Theophilus P. Chandler, Jr.
Architect
302 Walnut St Phila. Pa.

HELIOTYPE PRINTING CO. BOSTON

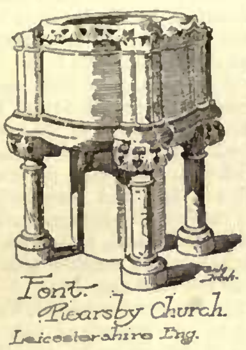

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"LET MONUMENTS PROCLAIM HIS FAME"

HELIOTYPE PRINTING CO. BOSTON.

THE RELATION OF DOMESTIC CHIMNEYS TO THE CONSTRUCTION OF ROOFS.



THERE is no detail in house construction so perplexing as that of chimneys, especially with those addicted to so-called smoking — that is, to not passing the smoke in the way intended, but periodically admitting it into the apartments. By the same rule, there is no detail about which so little is known, or which is subject to so much neglect in house planning and building. There are few who will deny the assertion that faulty chimneys are the rule, and that perfect ones are the exception, or that their faults arise from a variety of causes.

In the present chapter we propose to deal with the relation of chimneys to the construction of roofs, and to leave the character of the grate, the construction of the chimneys, the temperature of the rooms, the supply of air, the situation of the flue in internal or external walls, and their size and form for subsequent review. There is a common belief that in whatever position a chimney is situated, it is only necessary to carry it up to the height of the roof ridge; this is a popular error, and one that has intensified during the last century.

From the period of the old open fires of our ancestors, when the inmates breathed the wood or peat smoke, which mainly escaped from pent houses on the ridges of the roofs, there was a gradual advancement in the detail of chimney construction to the time of Queen Anne. The fire-hearth had been moved from the centre of the apartment to the wall, and the fire itself placed against a reredos, beneath a capacious chimney. These chimneys, in their infancy, were constructed of wood, lined or pargetted with clay, as may still be seen in our rural districts; or they were of brick, being independent constructions to the half-timber buildings, as seen in Gainsborough old hall. At the Queen Anne period, when houses were built of brick, the chimneys, although amalgamated with the buildings, remained important features of construction, and as such were carried to a great height above the roofs.

In some cases these Queen Anne chimneys were carried up with the gables, in others they rose from the level of the eaves; but in every instance their height was far superior to that of the ridge of the roof. From this date there was a gradual reduction in the capacity of the flues, a movement warranted by the introduction of grates, one which reduced the height and strength of the chimneys, and made them secondary features in house-building.

It is to this custom, the one followed, with few exceptions, by the builders of to-day, that we wish to confine our remarks.

Perhaps there has been no former period in the history of house-building in which smoky chimneys have been so common as they are at the present day. Certainly there has been no period when chimney doctors, patent cowls, etc., were so numerous. This in large measure is owing to the use of gables and steep-pitched roofs, details credited to the so-called revival of Gothic architecture, a style which introduced long and artificial lines of ridges, which act as screens for the wind, and disturbing details in the working of chimneys. The steep pitch of such roofs disturbs the passing wind, at one time raising it over the ridge, and at another depressing it, and causing down-draughts in the adjoining flues. If the chimneys of a house are to work, a flat roof is of all kinds the best. The second best is a roof with a low pitch hipped at all points. The third best is a high-pitched hipped roof, and the worst of all is a high-pitched roof freely gabled.

In the relation of domestic chimneys to the construction of roofs, it must be borne in mind that defects only present themselves in certain states or directions of the wind, and that, however a builder might try, he cannot succeed in constructing a chimney that will smoke under all circumstances. The wind in certain directions is favorable to the working of a defective chimney; in other cases it is

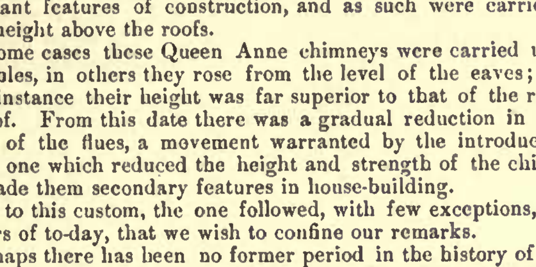


Fig. 1.

opposed to it, and hence the construction of a chimney that will work under all states of the wind is a desideratum.

There are certain sites of houses in which it is impossible to construct chimneys which will satisfactorily work under all circumstances, such as that of a hillside. In certain states of the wind it will come over the top, and pass down the hill, falling to the gradient of the land; in such cases down-draughts are created in the chimneys. In proof of this we can point to a steep-pitched gabled house on a hillside, on the skirt of an important town; it is the highest house of all, and its chimneys are black over with smoke, and a great number of them are surmounted with smoke-preventing cowls. The best sites are those on the summit of hills or on open level land, those in valleys being superior to those on hillside.

All outward circumstances being in favor, we will consider the various forms of chimneys in relation to the construction of roofs by the aid of diagrams. In doing so, we must assume there is no adjoining property overtopping the chimneys, as in Figure 1, which shows a forty feet street, with two-story houses on one side, and a tall mill upon the other. Here we see the wind passing over the tall building damping down the chimneys of the houses, which, were it in an opposite direction, would create an up-draught. Figure 2 shows a flat-roofed house, which has no influence upon the working of the chimneys. Figure 3 shows an ordinary row of houses, with an ordinary pitched roof. The flues at the ridge will work under all circumstances (so far as their outward construction is concerned), whilst those placed at a distance from that point will smoke, as they are within the influence of the falling air; and hence it is customary to see the outside flues (if regularly used) raised, or surmounted with cowls. Figure 4 shows a very bad style of chimney—viz., that placed upon the eave of a roof. If the roof is of flat pitch, and not very long on the span, such chimney may be relied upon to work if carried up a good height: but if the pitch is high or steep, and the span large, the evil is intensified; and such chimneys may be seen raised stage after stage, and surmounted with patent cowls, the whole stayed with iron bars to the roof, presenting appearances truly dangerous. Figure 5 shows a familiar form of placing chimneys on the eaves of steep-roofed houses. Figure 6 shows the roof-plan of a house where a steep pitch is indulged in. The chimneys A and B will not work when the wind is travelling from left to right, because a vacuum is created at that end of the building, which causes a strong down-draught in the air passing the line of the ridge. The other chimneys, so long as they are the height of the ridge, will work under any circumstances. We have this case actually before us; A and B are the only chimneys which have been raised on the building, and these flues are fitted with smoke-preventing pots and cowls of various patterns. The B flues are much the worst, owing to a fall in the ground, the house being much the highest at this point. The chimney stacks are a dangerous height above the eaves, and are supported by iron stays. There are ladders on the roof, and reared against the chimney at B, as if permanently in use. With all this paraphernalia, the passer-by may see at a glance that these chimneys are not satisfactory in their working.

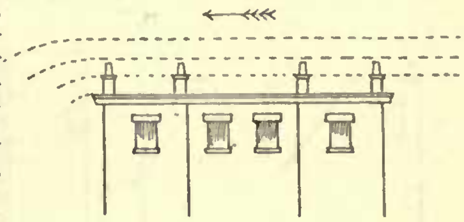


Fig. 2.

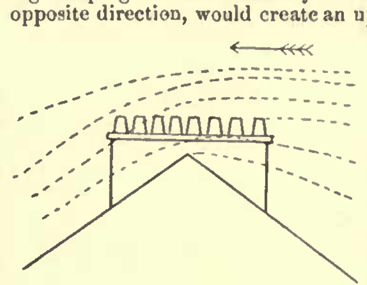


Fig. 3.

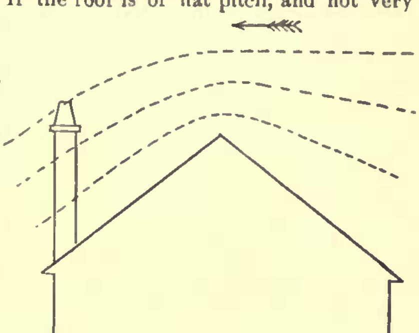


Fig. 4.

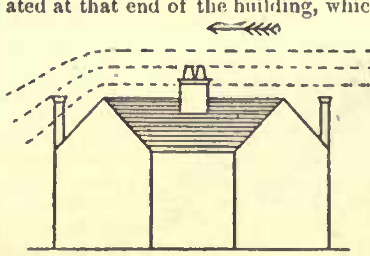


Fig. 5.

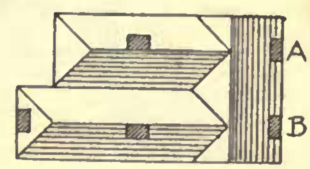


Fig. 6.

In house planning, the disposition of the chimneys is a matter of great importance. Steep pitch-roofs may be indulged in if the flues are carried up in the ridges. Gables creating cross ridges should be avoided; but where necessary two gables are advised; the chimney, when not convenient to be at the ridge, may be placed between the two, as in Figure 7. Where it is imperative to place the flues on the eave, as at A, Figure 7, the roof should be gabled at the back to support the chimney, as at B, Figure 7, by which a greater height may be safely indulged in, a further improvement being wrought by hipping the front gables. When the wind is coursing left to right, it

falls on passing the ridge to fill the vacuum at *c*, and in avoiding this down-draught, the chimney must be carried a great height. The force of hipping the main gables and shortening the ridge is thus seen, as it tends to give the chimney an increased height in connection with the falling current of air. A very stupid arrangement is commonly carried out in middle-class houses, of the kitchen being built out at the back, and the range being placed at right angles with

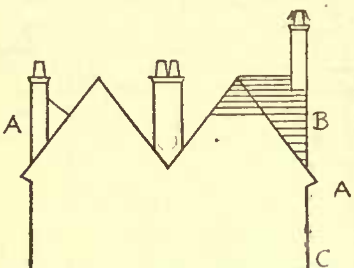


Fig. 7.

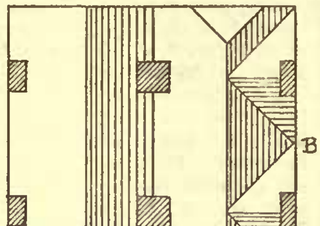
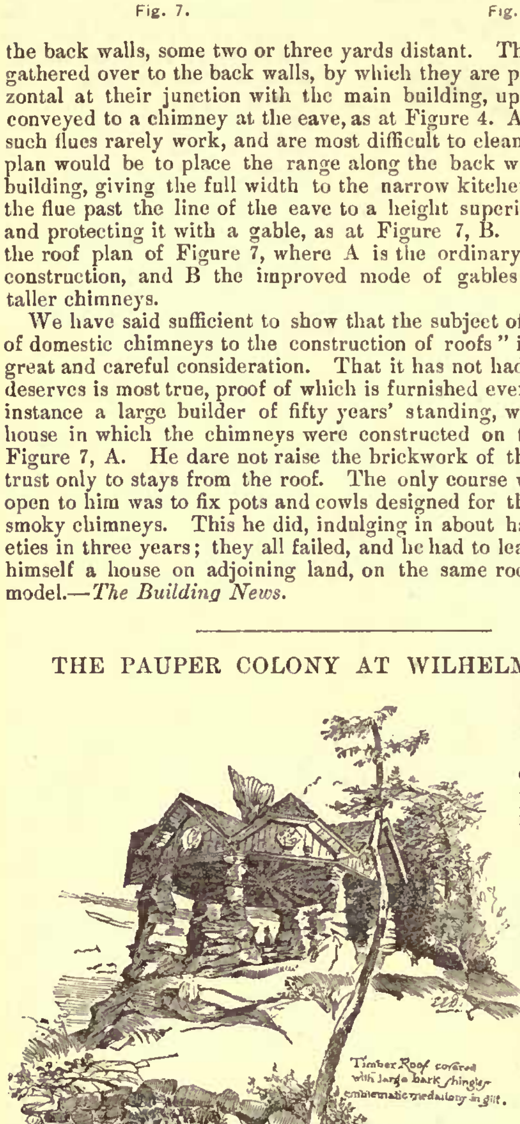


Fig. 8.

the back walls, some two or three yards distant. The flues are here gathered over to the back walls, by which they are particularly horizontal at their junction with the main building, up which they are conveyed to a chimney at the eave, as at Figure 4. As is well known, such flues rarely work, and are most difficult to clean. A far better plan would be to place the range along the back wall of the main building, giving the full width to the narrow kitchen, and carrying the flue past the line of the eave to a height superior to the ridge, and protecting it with a gable, as at Figure 7, B. Figure 8 shows the roof plan of Figure 7, where A is the ordinary faulty mode of construction, and B the improved mode of gables supporting the taller chimneys.

We have said sufficient to show that the subject of "The relation of domestic chimneys to the construction of roofs" is one worthy of great and careful consideration. That it has not had the attention it deserves is most true, proof of which is furnished every day. We can instance a large builder of fifty years' standing, who resided in a house in which the chimneys were constructed on the principle of Figure 7, A. He dare not raise the brickwork of the chimney, and trust only to stays from the roof. The only course which appeared open to him was to fix pots and cowls designed for the prevention of smoky chimneys. This he did, indulging in about half-a-dozen varieties in three years; they all failed, and he had to leave, having built himself a house on adjoining land, on the same roof and chimney model.—*The Building News.*

THE PAUPER COLONY AT WILHELMSDORF.



GERMAN vagrancy, like almost every form of pauperism, has been fostered by indiscriminate charity. It is more common in that country than in ours for the respectable handicraftsman to travel on foot from town to town; the old institution of the *Wanderjahre* used to lend a certain romance even to begging; and the idea of a wandering life seems to possess a fascination, half humorous and half pathetic, for the popular imagination. This latter feeling is so strong that we are told that in many districts peasants who seem utterly heartless in their dealings with their poorer neighbors are always liberal to the tramp who comes from a distance. Under these circumstances, it is not strange that the indolent should prefer travelling to working.

So clearly do the authorities perceive the root of the evil that in Saxony and, we believe, some parts of Bavaria, a fine is imposed on every one who gives alms to a beggar; and even where such drastic measures are not employed, every effort is made to dissuade the population from a practice which is at least as injurious as it is good-natured. But no amount of teaching or threatening will prevent men and women from assisting those whom they believe to be in immediate danger of starvation. The only hope, therefore, of imposing a check on their thoughtless liberality lies in making such a provision for destitute travellers as will prevent them falling into the utmost misery, while at the same time it offers no attraction to those who are simply disinclined to work.

Various plans for doing this have been adopted in different parts of Germany. The details and variations would hardly interest the general reader, and we shall, therefore, confine ourselves to giving a sketch of the system thought by Herr von Bodelschwingh to be the most perfect, that adopted in Herford. A committee of five members has there been formed, which sits under the presidency of the Mayor, and is assisted by twenty handicraftsmen, citizens of the town, who have volunteered their services, and who make it their business to ascertain what employment is to be had. As soon as a destitute traveller arrives he is directed to the Town Hall, and here he receives the name and address of one of the twenty who belongs to his own profession. If there is any employment to be had, he is sent to seek it; if there is none, he receives a ticket, which entitles him to dinner, or to supper, bed, and breakfast, as the case may be.

Still, it is clear that arrangements like this, however excellent, leave a great part of the evil where they found it. In periods of general depression a workman may traverse whole provinces without finding any employment. In the meanwhile his tools and a part of his wardrobe have, in all probability, been sold or pawned; at any rate, his appearance has become so ragged and disreputable that no master likes to engage him. It is to meet this difficulty, and to restore to respectable society the man who has either already become, or is in danger of becoming, a professional tramp, that the colony of Wilhelmsdorf has been founded. It is supported by voluntary subscriptions, by grants from the district and the province, and by the labor of the colonists. According to the original design it was to supply work to any one who asked for it; but the number of applicants was so large that it has been found necessary to admit none but natives of the districts that contribute to its support. And yet the terms offered are by no means easy. For the first fourteen days the colonist receives nothing but his board and lodging; during the next month he earns threepence, and afterward about fivepence a day, but not a farthing of ready money is paid to him. On his admission he is supplied with such articles of clothing as he is in want of, and these have first of all to be paid for; when this has been done his earnings are employed in the purchase of the tools required in his trade, and afterward, if he still continues to reside in the colony, they are invested in a savings bank for him. This, however, rarely happens, as it has hitherto been found easy to obtain employment for those who have behaved well in Wilhelmsdorf.

At present the colonists are almost exclusively employed in cultivating the estate that has been purchased. It was necessary to find an employment suited for all, that could be easily learned, and in which the labor even of the uninstructed soon became remunerative, and agriculture was considered the best. It is intended, however, by degrees to make provision for the exercise of the simpler trades — such as baking, shoemaking, and tailoring — by which of course a considerable saving might be effected. Yet even now, though it is not self-supporting, the colony has proved a financial success, as it has put almost a complete stop to indiscriminate almsgiving and the vagrancy which is the natural result in the districts by which it is supported. — *London Saturday Review.*

SUGGESTIONS FOR A GRANT MONUMENT COMPETITION.

Texas, September 30, 1885.

To the Editors of the American Architect: —

Dear Sirs,—Partaking of a good deal of interest in the Grant Monument Competition, I wish to make a few suggestions about the competition expected, which differs somewhat from those expressed in the New York suggestive address to the Chairman of the Grant Monument Committee. (See *American Architect*, No. 508, p. 138).

1. There should be a public competition, open for every architect, sculptor or artist, desirous of taking part.

2. The Chairman of the Monument Committee should invite the American Institute of Architects to select say three of their members to work out the programme for the competition, with a committee of two or three architects or artists, selected by the Monument Committee.

3. Each competitor should receive a list of about twenty names of prominent architects, sculptors, etc., selected by the programme committee, and willing to act as jurors in this competition. From this list each competitor shall select ten jurors, and these ten jurors elected by the competitors, and joined by ten jurors, nominated by the Monument Committee should form the jury.

4. The competitive designs for the monument should be kept more in the line of sketches or studies, instead of laboriously worked-out designs, thus saving a good deal of work, time and money to the competitors.

5. The competition closed, the jury should select say the best ten designs from all submitted, and award prizes of about $1,000 to each of them.

6. The jury will now draw up a more minute programme for the final competition among the ten successful competitors. Many points of the first programme may be improved in the second one. In this way the ten selected competitors will be enabled to come closer to the point.

7. This jury should also select another jury of say ten members

for the final competition, and the decision of this jury should be final. Successful competitors should not be selected for this jury.

8. The author of every prize design has to take part in the final competition, otherwise forfeiting his prize. The designs or models for the final competition should be accompanied by minute specifications, and the necessary detail drawings at a convenient scale, so that accurate estimates can be obtained on all ten prize designs.

9. The jury of the first competition should select about sixty designs (the ten prize designs included) which they find to be of merit. These sixty designs selected to be reproduced by the gelatine or heliotype process, arranged in an album or portfolio, according to their merits, and each author of these sixty designs, as well as the members of the juries, and programme committee should receive such an album as "Souvenir of the Grant Monument Competition."

Respectfully submitted by an Architect.

Columbus, O., September 28, 1885.

To the Editors of the American Architect: —

Dear Sirs, — On the 19th of September, you published the terms of a proposed competition, for a monument to General Grant, as suggested by a number of architects.

I desire the use of your columns for the purpose of objecting to some of the terms of the competition as proposed. Not that I am specially interested in this competition, but because so many gentlemen who are known to be among our ablest architects lend their names to a "loaded competition;" as I fear that such extended approval added to the effect of recent important competitions of the kind, may tend to commit the profession to a manner of competitinn which I deem the most objectionable of any I have known. I refer particularly to the idea of dividing the competitors into two classes; those deemed worthy of a special invitation, and guarantee of compensation without reference to the merit of the design presented; and those who are permitted to compete, with no compensation unless they win.

In any competition two objects should be sought. First, to obtain a suitable design; second, to render just remuneration to competitors. The first requires that men of real ability shall compete; and this giving special invitations, and rendering special compensation to a few is, no doubt, intended to secure the services of some who might not otherwise engage in the competition, owing, perhaps, to their overstock of dignity and lack of business courage, and perhaps to their excessive modesty and the vastness of their ability.

Certainly no such unseemly subsidizing of a few "eminent" competitors is required in order to secure the best attainable design. Make the premiums all general, instead of mostly special, and I assure you a better class of designs will be furnished than will be done under the plan suggested to the committee. But if it is true that such a "subsidy" is necessary to secure the attention of the "ability" of the country, why invite the "outside barbarians" at all? Why not limit the competition to the ten, and be done with it? Why let in the horde of "ambitious scramblers" who would care to contend for the cold victuals left by the dignified guests who eat at the "first table?"

The second object to be attained — just remuneration — requires that all who compete for the same thing be offered the same inducement—that he who works best must be paid best.

Either part of the competition suggested would be fair and honorable by itself, but when the two are combined it is certainly difficult to see how any one can enter the competition at either end without placing himself in the position on the one side, of an "ambitious scrambler," and on the other of a boastful big boy, who would like to play marbles, but won't do it unless the little boys agree to give his marbles back, in case he loses.

By all means let the race be free to the "fleetest feet," and make the "blooded stock" win the prize if they get it; or let us have a competition from which all but "first-class talent" shall be excluded.

Now, as one plan of competition has been suggested to the "Monument Committee," I will suggest another for the consideration of those who suggested the first one. In general terms as follows: —

Two competitions. First competition, free to all; time six months. Requirements: preliminary sketches to a given scale. Jury of award, ten architects and five sculptors selected by monument committee. Plans submitted under *nom-de-plume*. Compensation, $1,000 to each of ten designs, and a sum not exceeding $10,000 or more to be divided between other competitors as may be recommended by jury; not over $600 to any one.

Second competition. Free to ten selected in first competition; time, one year. Requirements: full scale drawings, with perspective or model. Jury of award, same as above, but no persons to sit on both juries.

Plans submitted under *nom-de-plume*, but different from first one so that the name of each competitor remains unknown until after the final award. Compensation: 1st premium, to execute the work at usual rates; 2d premium, $3,000; 3d, $2,000; 4th, $1,000; each of the others, $500.

No person interested in any design to sit on juries. Each competitor before receiving pay to furnish lithograph plate, or drawing suitable for heliotype process, all premature designs to be published, and a copy to all competitors. Monument to cost $1,000,000, or if less, reduce time and compensations accordingly.

Respectfully yours, J. W. Yost.

New York, September 29, 1885.

To the Editors of the American Architect: —

Dear Sirs, — I hope that my design for Grant memorial, motto "*Let Monuments proclaim his fame,*" will be returned to me without delay. I have seen several architects, and the feeling is unanimous that the award of prizes is very unsatisfactory. I am not speaking of my own design, which was not published, but of those which were published there were several which deserved the prizes more than those selected. No. 2 is very good, but No. 1 is a preposterous piece of nonsense. The interior chapel might have been very nice, but a "monument" must strike at first sight. I feel convinced after seeing the premiated design that your committee was and is incapable of comprehending the problem, and if their taste and ideas in this respect are representative of "American ideas of monuments," then I feel it would be better for the reputation of this country to abandon the scheme entirely. I have very little doubt that another "work of art" such as the "Washington Monument" will be erected.

Respectfully,

"*Let Monuments, etc.*"

[As we were not ourselves actors in the matter of the Grant Memorial competition, the foregoing letter can have been addressed to us only for purposes of publication, and we cheerfully accord it the necessary space — nay, we do more; as a justification of the inferences which the writer wishes to have deduced, we publish on another page the design submitted by him in the late competition: a publication which will have a certain interest to the jurors, a least. Taken together we think a moral or two may be discovered. — Eds. American Architect.]

ARCHITECTURAL ASSOCIATION OF MINNESOTA.

St. Paul, Minn., September 12, 1885.

To the Editors of the American Architect: —

Dear Sirs, — At the regular monthly meeting of the Architectural Association of Minnesota, held on September 8, 1885, the following resolutions were passed unanimously: —

"*Be it resolved,* That on and after the first day of January, A. D., 1886, the members of the Architectural Association of Minnesota abandon the system of measurement by feet and inches, and adopt a system of measurement by feet and decimal parts of a foot."

"*Be it resolved,* That the Secretary notify all the leading architectural journals of the United States and the local papers of this action of the Architectural Association of Minnesota."

I am, sir, yours, fraternally,

H. Sackville Treherne,
Secretary.

NOTES AND CLIPPINGS.

The Cost of Completing Cologne Cathedral. — The Cologne *Gazette* states that the cost of restoring and completing the great cathedral from 1823, when the work was resumed after a neglect of nearly three quarters of a century, has been $5,250,000. This is independent of gifts of valuable objects for the religious services or the decoration of the building, and of a large number of private donations and funds for pious foundations.

The Certosa, Pavia, Italy. — An authentic document from the archives S. Fidele, discovered by Calvi, proves that the design of the façade of the Church of the Certosa was made by a certain Bernardo, of Venezia, in 1396, whom the Duke of Milan called to Pavia to decorate his castle, and also for this very work of the Certosa. Whether he was a Lombard working in Venice, or a Venetian, is unknown. There is, however, no uncertainty as to the special glory of the façade being wholly due to Lombard genius. The design of the façade was given seventy years later by Ambrogio da Fossano (called il Borgognone) not born at Fossano, a little town of Piedmont, but at Milan, of the noble family of Fossano. It is doubtless owing to the fact that he was an accomplished painter that the famous façade is not treated in a severe architectural style, but as a great page to be adorned, a vast space to be illustrated. The result is uniquely beautiful, and the earlier Lombard art is there delightfully combined with the classic element which finally prevailed in all Renaissance work. Although it is covered with decoration, with all its richness it has a delicacy and preciousness which reconcile us to its profusion of ornament. It was to fulfil a vow of his wife, Caterina, that Duke Gian Galedzzo, with solemn pomp laid the foundation stone of the Certosa of Pavia on the 13th of September, 1386. In two years the principal part of the Church was erected, and 120 monks, with their superiors, were installed in the monastery. A crowd of admirable sculptors and painters were engaged to adorn the church. For the interior work, later, many generations of a family of artists, the Sacchis, labored for two centuries upon the mosaics of the altar fronts alone. I do not say this labor was always wisely expended. Mosaic of this imitative kind, rivalling painting, is extraordinary as a result of skill and labor, but it is not necessarily a delightful thing to work at. Italian or Lombard taste is here at fault, and the older Byzantine mosaic of St. Mark's at Venice is better, primarily, because it is never imitative. No imitative mosaic work is a satisfactory artistic result, for the better the imitation of nature, the greater the difficulty surmounted in a material unsuited, foreign to the best rendering of the thing expressed, the more remarkable it may be, it is so much the less within the proper means of artistic work. But it is not my purpose to engage your attention with this vulgar form of decoration — vulgar because it is less beautiful than costly, and in no way to be ranked with the very different mosaic of St. Mark's at Venice, where mosaic is all it should be, decorative in the extreme, splendid with the lustre of gold and bright with positive color, a brilliant and an everlasting rendering of conventional, typical forms of life. — *Correspondence of the New York Commercial Advertiser.*

A Hint to Book-lenders. — This anecdote about the late Mr. Thomas, famous as an antiquary, is related by the *Athenæum*: "I remember," says a correspondent, "once wishing to borrow a couple of volumes of Nichols's '*Literary Anecdotes*,' but Thomas would not hear of it. 'No, my dear ——,' he said, 'you must take them all; then, when you return them, *I* shall have the work complete, and (smiling good-naturedly) if you forget to return them *you* will have a complete set.'"

A Necklace of Mummy-Eyes.—A necklace of mummy-eyes is being made in New York for the wife of W. E. Curtis, of the South American Commission. When the old Peruvians died and were mummified, centuries before Pizarro's time, the men who did the embalming had trouble in making the face look natural, because the eyes disappeared. So they took the eyes of a kind of fish with a long Latin name, and used them instead. The eyes of the fish were spherical, and the Peruvians cut them across transversely. The exposed flat section somewhat resembles in appearance the human eye. These planed-off eyes were dried and hardened, and were put in the mummy's eye-sockets. Properly placed, they gave the mummy a natural air, and there was no necessity for closing the eyelids. The material looks like fine amber. The eyes to be used in making the necklace were brought from South America by a member of the Commission.—*Philadelphia Press.*

Lighthouse Illuminants. — After twelve months of experiments at the South Foreland, says the *Builder*, the Trinity House Committee have made their report upon the relative merits of electricity, oil, and gas as lighthouse illuminants. The committee sum up their opinion thus:—

1. That the electric light as exhibited in the A experimental tower at the South Foreland has proved to be the most powerful light under all conditions of weather, and to have the greatest penetrative power in fog.

2. That for all practical purposes the gas-light as exemplified by Mr. Wigham's multiform system in B experimental tower, and the oil-light as exemplified by the Trinity House Douglas six-wick burners in multiform arrangement up to triform in C experimental tower, when shown through revolving lenses, are equal, light for light, in all conditions of weather; but that quadriform gas is a little better than triform oil.

3. That when shown through fixed lenses, as arranged in the experimental towers, the superiority of the superposed gas-light is unquestionable. The larger diameter of the gas flames, and the lights being much nearer to each other in the gas-lantern, gives the beam a more compact and intense appearance than that issuing from the more widely separated oil-burners.

4. That for lighthouse illumination with gas the Douglas patent gas-burners are much more efficient and economical than the Wigham gas-burners.

5. That for the ordinary necessities of lighthouse illumination mineral oil is the most suitable and economical illuminant, and that for salient headlands, important landfalls, and places where a very powerful light is required, electricity offers the greatest advantages.

The Byzantine Museum at Ravenna. — An incident of much more than passing interest to the archæologist and architect has just taken place, in the signing by King Humbert of a decree to establish a Byzantine Museum in the ancient city of Ravenna, which stands in melancholy grandeur on the western shore of the Adriatic, far from the hurly-burly of the nineteenth century. Ravenna, indeed, is far more Byzantine than Byzantium itself, or what was once Byzantium, but is now the modern capital of Constantinople; and there is no city in the world which contains so many traces of the latter Roman life, when it was the famous Augustan port of Classe, commanding the commerce of the Adriatic and Greece, long before Venice was heard of. Its culminating point of prosperity was at the era when the Hums and Goths rose to power, and although these latter were considered barbarians, the most beautiful churches in Ravenna were erected by the Gothic Emperor Theodoric in 493. At the reaction under Justinian, when the Roman influence began again to be felt, the city was adorned with new churches, and especially those of San Vitale, with its glorious mosaics, and San Apollinari. It may, indeed, be said to be the mausoleum of the ecclesiastical architecture of that period, a characteristic which it retains at the present day, and which is partly owing to the fact of the main line from Bologna to Ancona passing at a considerable distance from it (although it possesses a branch), and partly, that it is situated amongst marshes somewhat notorious for their malarious influences. In its way, Ravenna may be said to offer as much interest as Pompeii and Herculaneum, and although it has never been subjected to the sudden catastrophes which overtook these latter places, it has witnessed the gradual sinking of the soil, and the covering of alluvial layers probably conceals quite as many art treasures as are visible above ground. Systematic investigation and excavation would, doubtless bring to light a vast amount of archæological treasure, and it is to be desired that the Italian Government should, ere long, set such an undertaking on foot. — *The Builder.*

The Awful Pollution of the London Thames. — The average quantity of London sewage daily poured into the Thames at the outfalls may be approximately stated as 700,000 tons, or 157,000,000 gallons, or 25,000,000 cubic feet, or a cube of 293 feet diameter. This estimate is below the truth. The foul organic matter of the sewage is at once attacked by the dissolved oxygen of the water, acting through the agency of low organisms, and ultimately destroyed, the process being practically completed between Gravesend and Southend. But above Gravesend the river is polluted throughout the whole of the tidal portion quite up to Teddington with actual sewage matter. In the process of destruction putrefaction precedes oxidation, and a foul smell is generated which, in hot weather, when putrefaction is rapid, becomes evident to every impartial nose. The worst portion of the river is, of course, between Greenwich and Greenhithe, which may be described as the sewage zone of the river. Here dissolved oxygen is almost absent, so rapidly is it taken up by the sewage, and in the recent hot weather, as in that of last summer, the stench of the river has sometimes been unbearable. Within the last month it has been distinctly smelt at Erith, more than half a mile from the river, and persons who from duty or expected pleasure have spent days on the water have suffered from diarrhœa in consequence. Two of the Royal Commissioners during the late inquiry were attacked in the same way, and recorded their personal experience in the final report. Evidently this state of things cannot be borne much longer. It is disgusting and dangerous now, and it is ten times more dangerous in view of a possible, we might almost say probable, visit of cholera. However imperfect our knowledge of cholera may be, we know that it is propagated by a special poison, probably an organized poison, which can be carried in water, in air, and in other ways. Water pollution is a common, and perhaps the most important means of extension; but air pollution is also effective, as was proved by the late Professor Parkes in his elaborate study of the epidemic in Southampton in 1866, where water pollution was out of the question. Cholera finds its natural home in low and foul districts, and particularly by foul rivers. If further evidence on this point were wanted, it would be furnished in abundance by the recent fearful experience of Spain. There can be no doubt that even a small epidemic of cholera in London might make the river a vast hotbed for the disease. — *London Saturday Review.*

Thomas Thornycroft's Death. — Recently a very remarkable man passed from among us — the late Thomas Thornycroft, sculptor — whose remains were yesterday interred in old Chiswick Churchyard with what may be truly termed funeral honors, for present in the churchyard were not only his family and old friends, but the whole body of workmen employed in Messrs. Thornycroft & Donaldson's famous torpedo boat works, who turned out to show the sincere respect in which they held one who, though not himself an engineer, might, from the early appreciation of his son's engineering ability and the training which he gave him, be fairly called the father of the firm. At the works he was a constant visitor, and always had a kindly word for every one. In fact, his deep interest in those works had of late years and in some measure supplanted his interest in sculpture, to which art in early life he had so ardently devoted his powers. The eldest son of a Cheshire yeoman, he was in his teens intended for the medical profession, but his artistic talent overruled and finally led him to pursue sculpture. He was articled to Mr. John Francis, the sculptor, his future father-in-law, in whose studio he acquired the technique of his art, and pursued the usual student's course, such as that was a half century ago. But Thomas Thornycroft aspired to raise sculpture out of the low state into which it had fallen, and accordingly he and his young wife went to Rome to study the antique. The result of the visit was a series of works which will show to the future critic of English sculpture that he had imbibed the spirit of the antique, and that there was scarcely any one of his time who was his compeer in the classic, in the true classic feeling for sculpture. We need do no more in this brief notice than to refer to his "Medea," his "Alfred the Great," his group for the Albert Memorial, and his portrait statue of Lady Elizabeth Stanhope. Like most artists of considerable abilities, his mental powers were various; he was quick in mechanical invention, and his son has always readily acknowledged the many valuable hints he received from him. His double talent was curiously manifested in his children, one of his sons being the well known engineer, and the other, Mr. Hamo Thornycroft, A. R. A., one of the most admirable sculptors of our time. He was also the father of Miss Helen Thornycroft, the flower painter. — *London Times.*

Maximum Wind Pressure. —During the hearing by the Parliamentary Committee of the case for the promoters of the Tower Bridge over the Thames, Mr. B. Baker, who was called to prove the stability of the proposed structure, gave evidence upon the phenomena of wind pressure as observed by him in connection with the construction of the Forth Bridge. Mr. Baker stated that, from recorded observations in the Firth or Forth, extending over many years, he has come to the conclusion that no pressure at all approaching fifty-six pounds per square foot can prevail over a surface of any magnitude. He declared that no such pressure has for many years occurred in the Thames Valley, instancing, in proof of this assertion, the number of large gasholders scattered up and down the river side. If a hurricane of fifty-six pounds to the square foot had encountered any of these structures, Mr. Baker believes they would have been doubled up and blown across London, as they have no power of resistance to external pressures beyond the pressure of the gas from within, which he values at not more than eighteen pounds per square foot. If, therefore, not the slightest damage of this kind has ever been done by wind to any of the London gasholders, which is a fact, it is a demonstration that they have never been exposed to a pressure of fifty-six pounds per foot. It is Mr. Baker's experience at the Forth Bridge works that a gale registering by his improved instruments not more than sixteen and one-half pounds per square foot completely stops all ordinary traffic on the estuary, preventing the running even of powerful ferry-boats. Mr. Baker believes that this pressure is rarely exceeded. He declines to place credit in ordinary anemometer readings, which sometimes show extreme velocities, and he points out that trains do not cease running in gales when anemometers will register forty-six pounds pressure to the foot, though a pressure of forty pounds of wind per square foot on its exposed side would certainly upset an ordinary train.—*The Iron Age.*

Bicornet and the Devil. — Among the curious and varied ironwork ornaments on the oldest door of Notre Dame at Paris there is a little figure of a man, with two horns on his head, who ends below as a fish. This figure is called Bicornet. Bicornet was a master locksmith who had agreed by a certain day to supply the doors of the church with ironwork, and found that he had but twenty-four hours to finish the job. Determined to do it, he summoned the devil, sold himself, and with this sulphurous apprentice went to work. The devil put on a leather apron and helped him so well that Bicornet had the door done by morning, and has worn horns ever since. — *Exchange.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

326,913. WINDOW. — Marion Scudder Bonney, Savannah, Ga.
326,945. FILTERING CUT-OFF RAIN-WATER SPOUT FOR CISTERNS.—Jonathan E. Burdge, Home City, O.
326,947. APPARATUS FOR BURNING FUEL. — Robert E. Burns, San Francisco, Cal.
326,952. REFRIGERATOR. — Jas. Castell, Blue Rapids, Kan.
326,956. SPRING-HINGE. — Levi M. Devore, Freeport, Ill.
326,958. METAL ROOFING. — James H. Eller, Canton, O.
326,959. APPARATUS FOR MAKING GAS.—Walter P. Elliott, New Brunswick, N. J.
326,961. FIRE-ESCAPE. — Leopold A. H. Engelke, Philadelphia, Pa.
326,967. HINGE FOR AWNING-BLINDS.—Chas. Garlick, Syracuse, N. Y.
326,976. POST-HOLE AUGER.—James Hagans, Maxwell, Ind.
326,977. WINDOW-PLATFORM. — Henry Hagemann, Chicago, Ill.
326,978. PIPE-WRENCH. — William Harris, Pittsburgh, Pa.
326,982. STEAM-HEATING BOILER. — Thomas P. Hogan, Buffalo, N. Y.
327,015. SAW-HANDLE. —Robert E. Poindexter, Indianapolis, Ind.
327,030. LUMBER-DRIER.—Heman S. Smith, Brooklyn, N. Y.
327,048. SAFETY-ATTACHMENT FOR ELEVATORS AND INCLINED RAILWAYS.—Frederick Wittram, San Francisco, Cal.
327,053. LOCK.—Joseph R. Ames, Clearfield County, Pa.
327,085. WOOD-FILLER. — Adolf Hoexter, Offenbach-on-the-Main, and Georg Schulter, Lohr-on-the-Main, Germany.
327,094. WASH-BOWL.—Harvey C. Lowrie, Denver, Col.
327,104. DRAWER. — Reuben W. Perry, Saundersville, Mass.
327,106. WEATHER-STRIP. —Warren H. Plympton, Providence, R. I.
327,129. SHELVING-BRACKET.—John Bains, Piqua, Ohio.
327,132. AUTOMATIC DAMPER-REGULATOR. — John Burge, Westfield, Mass.
327,133. DOOR-CONNECTION FOR WATER-CLOSET CISTERNS.—Daniel Burrows, Brooklyn, N. Y.
327,144. SASH-FASTENER.—Wm. B. Dager, Canton, Ohio.
327,147. CASTER.—Nathan Drucker, Cincinnati, O.
327,148. METAL-BORING BIT. — Luther R. Faught, Philadelphia, Pa.
327,155. WATER-METER. — George S. Follansbee, Boston, Mass.
327,157. LATCH. — Orvellas H. Gilbert, Newark, N. J.
327,161. FRICTION SHADE-ROLLER. — James Hardman, Jr., Belleville, N. J.
327,167. WATER-ELEVATOR. —Benjamin J. Hewitt, Manton, Mich.
327,208. WIRE FENCE. — Charles W. Weld, Southbridge, Mass.
327,209. WASH-TUB, SINK OR OTHER VESSEL MADE OF CEMENT, ETC. — Carl Wesley, West New York, N. J.
327,213. NUT-LOCK. — Lewis J. Williamson, East Fairfield, O.
327,219. WATER-CLOSET. — Harry J. Bailey, Pittsburgh, Pa.
327,221. REMOVABLE TABLE-LEG. — Thaddeus C. Beach, Detroit, Mich.
327,226. STUDENT'S DRAUGHTING-CASE. — W. R. Briggs, Bridgeport, Conn.
327,226. DOOR-SHIELD. — Myron Camp, Sedgwick, Kans.
327,235-236. SLIDING WINDOW-BLIND. — Rollin M. Clapp, Burlington, Vt.
327,266. APPARATUS FOR OPERATING DRY-EARTH CLOSETS.—William Heap, Owen Sound, Ontario, Can.
327,272. STAND-PIPE ATTACHMENT FOR BATH-TUBS.—William A. Johnson, Boston, Mass.
327,274. TILE-LAYING MACHINE. — George Keith Harmon, Ill.
327,276. SASH-CORD FASTENER. —Silas Land, Philadelphia, Pa.
327,279. CONDUCTOR-HOOK. — John Leadley, Detroit, Mich.
327,287. CURTAIN-FIXTURE. — Lewis A. Mallory, Sullivan, O.
327,288. STONE-POLISHING MACHINE. — James W. Maloy, Boston, Mass.
327,289. CAR-VENTILATOR. — William D. Mann, New York, N. Y.
327,295. OVERFLOW-PIPE FOR BATH-TUBS. — Samuel G. McFarland, New York, N. Y.
327,321. STOVE-PIPE THIMBLE OR SLEEVE.—John Scheuermann, Cleveland, O.
327,330. VENTILATOR. — Thomas J. Simpson, Worthington, Minn.
327,316. PLANING-MACHINE. — Henry B. Stillman and William F. Patterson, Boston, Mass.
327,378. CURTAIN-FIXTURE. —Richard R. Brouner, Washington, D. C.
327,396. OPEN FIREPLACE. — Daniel E. Jones, Denton, Tex.
327,413. KNOCKDOWN TABLE. — George Kohrbach, New Haven, Conn.
327,414. VENTILATOR.—William Scharnweber, Jefferson, Ill.
327,415. WINDOW-VENTILATOR. — William Scharnweber, Jefferson, Ill.
327,410. SAW-SHARPENING DEVICE.—Wm. Tucker, East Brookfield, Mass.
327,443. FENCE-POST AND WIRE-FASTENING. —Edward C. Jones, Hamilton, Ontario, Can.
327,447. MIXED PAINT.—David Lublinski, Schwetz, Prussia, Germany.
327,450. DOOR-HANGER.—Henry Myers, Alton, Ill.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty-three permits have been granted, the more important of which are the following: —

German Evangelical Salem Church, brick church, n w cor. Battery Ave. and Randall St.

Border State Savings Bank, three-st'y brick building, s e cor. Baltimore and Poppleton Sts.

H. Nordman, three-st'y brick building, s w cor. John St. and Central Ave.

A. Fennaman, three-st'y brick building, e s Fremont St., s of Burgunder Alley.

G. W. Cooper & Son, 2 two-st'y brick buildings, w e Chester St., n of Fayette St.

E. W. Gorman, 9 two-st'y brick buildings, n s Hoffman St., commencing n e cor. Washington St.; 6 two-st'y brick buildings, e s Washington St., commencing s e cor. Keyser St.; and 5 two-st'y brick buildings, s s Keyser St., e of Washington St.

J. Maloney, 5 three-st'y brick buildings, w s Ridgely St., n of Stockholm St.

P. A. Pindell, 8 three-st'y brick buildings, John St., s of McMechen St.

Boston.

BUILDING PERMITS. — *Lee St.*, near Child St., dwell., 20' x 28'; Joseph H. Rowe, owner; M. H. Fossett, builder.

Washington St., near Oak Sq., dwell., 23' x 48'; F. W. Webb, owner; E. H. Carter, builder.

Brewer St., near Eliot St., dwell., 23' x 29'; O. F. Adams, owner and builder.

Elm Lawn, cor. Centre St., dwell., 28' x 29'; Geo. F. Pinkham, owner; Geo. E. Thomas, builder.

Harbor View St., cor. Grant St., dwell., 24' x 38'; Winslow Holbrook, owner; W. T. Eaton, builder.

Chelsea St., No. 75, dwell., 22' x 47'; Mrs. E. McElwayne, owner.

Greenwich St., cor. Commercial St., dwell. and store, 23' x 35', James Farren, owner; W. T. Eaton, builder.

Heath St., Nos. 259-261, dwell., 24' x 47'; William Jacobs, owner; R. D. Ward, builder.

Bearse Ave., near Butler St., poultry-house, 8' x 150'; F. G. Gibson, owner and builder.

Brooklyn.

BUILDING PERMITS.—*Fort Greene Pl., Nos.* 174 *and* 176, four-st'y brick dwell., gravel roof, brick cornice; cost, $20,000; owner, Geo. H. Hammond, Manhattan Market; architect, J. G. Glover; mason, A. Rutan; contractor, not selected.

Vanderbilt Ave., e s, 107' n Lafayette Ave., two-st'y brick carriage-house, tin roof, iron cornice; cost, $4,000; owner, Mrs. Rose Howe, 330 Clinton Ave.; architects and builders, Mills & Bush.

Stagg St., n s, 325' w Waterbury St., three-st'y tenement, tin roof; cost, $4,500; owners, Roeder & Kraemer, 148 to 152 Bushwick Ave.; architect, H. Schaeffer; builders, M. Metzen and J. C. Hesse.

Gates Ave., No. 486, s s, 225' w Marcy Ave., four-st'y brick store and flats, tin roof, wooden cornice; cost, about $6,000; owner, F. C. Vrooman, 444 Gates Ave.; architect, J. F. Vrooman; mason, not selected; contractor, F. C. Vrooman.

Willoughby Ave., n s, 50' w Sumner Ave., 2 three-st'y brick dwells., tin roofs, wooden cornices; cost, total, $17,000; owner, A. Loughi, Vernon Ave., near Sumner Ave.; architect, P. H. Gilbert; builder, A. Miller.

Hull St., n s, 100' e Hopkinson Ave., 5 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,500; owner, Daniel Lauer, 76 McDougal St.; architects and builders, Weeks & Lauer.

Degraw St., s s, 60' e Hoyt St., vault and chimney; cost, $4,000; owner, Jas. S. Duffy, Sackett and Hoyt Sts.; architect, T. F. Houghton.

Frost St., No. 146, s e, 72' w Graham Ave., three-st'y frame tenement, tin roof; cost, $3,600; owner, A. J. Cook, of Howell, Orange County, New York; architects and contractors, Sammis & Bedford; masons, Boyle & Brazill.

George St., Nos. 117 *and* 119, n e, 150' e Homburg Ave., 2 three-st'y frame tenements, tin roofs; cost, each, $4,200; owner, Wm. Wolf, Broadway and Fayette St.; architect, Th. Engelhardt; builder, Joseph Wagner, Jr.

Varet St., Nos. 113 *and* 115, n s, 165' w Ewen St., four-st'y brick dwell., tin roof, iron cornice; cost, $8,000; owner, James S. Schneider, 571 Broadway; architect, Th. Engelhardt; builders, J. Rauth and D. Kreuder.

Beaver St., No. 38, e s, 368' s Flushing Ave., two-st'y and basement frame dwell., tin roof; cost, $4,200; owner and builder, Samuel Strauss, 493 Bushwick Ave.; architect, Th. Engelhardt.

Eighth St., s s, 250' e Fifth Ave., 4 two-st'y and basement brick dwells., tin roofs, tin and wooden cornices; cost, each, $4,000; owner, Chas. Long, 299 Seventh Ave.; builder, J. F. Wood.

Eighth St., n s, 200' w Eighth Ave., 6 two-st'y and basement brick dwells., tin roofs, tin and wooden cornices; cost, each, $5,000; owner and builder, same as last.

Hamburgh St., e s, 50' s Prospect St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,200. owner and architect, James Connolly, 125 Ainslie St.; builders, J. Rueger and J. Dreher.

Hudson Ave., No. 473, five-st'y brick storage, tin roof. brick cornice; cost, $8,900; owner, Wm. H. Bolton, 471 Hudson Ave.; architect, C. F. Eisenach; builders, Morris & Selover.

Second Pl., n s, 25' 6" e Henry St., 6 three-st'y and basement dwells., mansard, slate and gravel roofs, brick cornices; cost, each, $4,500; owner, Mrs. M. V. Phillips, 251 Washington Ave.; architect, G. L. Morse; builder, J. J. Cody.

Madison St., s s, 350' e Patchen Ave., 6 three-st'y and basement, two-st'y and basement, and four-st'y dwells., tin roofs, wooden cornices; cost, each, $4,500; owner, A. S. Walsh; architect and builder, T. Miller.

Chicago.

BUILDING PERMITS. — A. B. McChesney, 2 two-st'y stores and flats, 748-750 West Harrison St.; cost, $8,000; architect, Swift.

F. Kroula, three-st'y dwell., 26 Evans St.; cost, $3,500.

M. Schmit, two-st'y dwell., 158 Napoleon St.; cost, $3,500; architect, Stude.

Mrs. St. Clair, three-st'y flats, 207 Chestnut St.; cost, $3,500; architect, N. S. Pentecost.

J. Lehmann, three-st'y store and flats, 3600 Wentworth Ave.; cost, $5,000; architect, J. F. Doerr.

G. Jones, three-st'y store and flats, 444 Wells St.; cost, $3,000; architect, G. Jones.

H. Kilpp, three-st'y store and dwell., 387 Clybourne Ave.; cost, $4,000; architect, F. Thompson.

W. D. Kerfoot & Co., 2 two-st'y cottages, Iowa St.; cost, $4,000.

J. Byrne, three-st'y store and dwell., 3149 Wentworth Ave.; cost, $5,000; architect, J. Speyer.

P. H. Witt, 2 two-st'y dwells., 3807-3809 Stanton Ave.; cost, $4,000.

D. A. Titcomb, two-st'y store and dwell., 128 North Western Ave.; cost, $4,000; architect, H. J. B. Hunter.

H. Kellman, 2 three-st'y flats, 208-210 Cass St.; cost, $10,000; architects, Frohman & Gebsen.

H. B. Wheeler, 3 two-st'y dwells, 3804-3808 Indiana St.; cost, $12,000; architects, Wheelock & Clay.

R. L. Martin, 6 three-st'y dwells., 91-101 Arthington St.; cost, $22,000.

R. L. Martin, 18 two-st'y dwells., Loomis St.; cost, $68,000.

S. W. Fallows, 8 three-st'y flats, Washington and Carpenter Sts.; cost, $70,000.

T. Massa, two-st'y dwell., 819 Warren Ave.; cost, $6,000.

J. Wellenhofer, two-st'y flats, 242 Centre Ave.; cost, $4,000.

H. Turner, two-st'y dwell., 420 Belden Ave.; cost, $4,000.

H. Shannon, two-st'y dwell., 571 Lasalle Ave.; cost, $7,000.

E. Wight, two-st'y dwell., 856 Warren Ave.; cost, $3,500; architect, Garnsey.

S. Knight, two-st'y dwell., 308 Idaho St.; cost, $3,500.

F. Knera, two-st'y store and flat, 3069 Main St.; cost, $2,500.

Campbell & Furst, 2 two-st'y dwells., 308 Lasalle Ave.; cost, $12,000.

P. Rinn, two-st'y dwell., 615 Lasalle Ave.; cost, $12,000; architect, T. Karls.

S. Florsheim, two-st'y dwell., 3143 Michigan Ave.; cost, $20,000.

E. P. Anthony, three-st'y dwell., 612 Fulton St.; cost, $5,000.

G. Rupbo, three-st'y dwell., 239 Lincoln Ave.; cost, $6,000; architect, H. M. Hansen.

G. Schmidt and J. H. Huber, 4 two-st'y dwells., 70-74 Maple St.; cost, $20,000; architect, J. H. Huber.

M. & A. Gordon, two-st'y dwell., 1059 Jackson St.; cost, $3,500.

Mrs. A. C. Clancy, two-st'y dwell., 507 Congress St.; cost, $4,500.

A. Forrest, two-st'y store and dwell., 429 South Western Ave.; cost, $3,500.

R. Garnett, two-st'y flats, 165 Robey St.; cost, $6,000.

O. M. Brady, two-st'y bakery, 702 West Lake St.; cost, $4,000.

J. Burrows, three-st'y flats, 1199 Washington Bouv.; cost, $5,000.

Carpenter Bros., two-st'y store and flats, 550 West Lake St.; cost, $7,000.

Mrs. B. Hellas, two-st'y flats; cost, $2,700; architect, G. Edbrooke.

A. Conrad, two-st'y dwell., 339 Maxwell St.; cost, $4,000.

W. Johnson, three-st'y flat, 179 North Curtis St.; cost, $4,000.

J. Ward, two-st'y dwell., 427 Oak St.; cost, $4,000.

E. F. Pulsifer, 2 two-st'y dwells., 19-21 Twenty-third St.; cost, $8,000.

A. Sickel, two-st'y flat, 254 Sheffield St.; cost, $3,000.

A. Krowsmock, two-st'y dwell., 453 Elston Ave.; cost, $3,700.

S. McAuley, three-st'y flats, 57 Centre Ave.; cost, $5,500.

M. Partell, three-st'y dwell., 55 Wisconsin St.; cost, $4,000.

C. Schmidt, 2 three-st'y stores and dwells., 3101-3103 Wentworth Ave.; cost, $15,000.

W. Fallows, 5 two-st'y dwells., 337-345 Paulina St.; cost, $10,000.

S. H. Wheeler, 10 two-st'y stores and dwells., 1353-71 West Lake St.; cost, $30,000.

Turner & Bond, 15 dwells., Parnell Ave.; cost, $15,000.

G. H. Cole, two-st'y dwell., 3137 Forest Ave.; cost, $8,000.

G. Gross, 2 two-st'y stores and dwells., 627-629 West Madison St.; cost, $10,000.

W. P. Fitzpatrick, three-st'y store and dwell., 439 Ogden Ave.; cost, $6,500.

J. Spry, 2 three-st'y dwells., 114-116 Sangamon St. cost, $6,000.

Hanke Bros., three-st'y factory, Ada and Kinz Sts.; cost, $9,000.

Cincinnati.

BUILDING PERMITS. — Gordon McNeil, two-and-one-half-st'y brick building, Vine and Hammond Sts. cost, $2,790.

Mrs. E. Wenke, two-st'y brick building, Queen City Ave.; cost, $2,500.
C. F. Lawlor, three-st'y frame building, Warsaw Pike and Black St.; cost, $2,500.
Geo. Schmidt, ice-cellar, Fifth and James Ave., Camp Washington; cost, $4,000.
Louis Fencher, three-st'y brick building, 383 Findlay St.; cost, $4,200.
F. Otte, four-st'y brick building, Court and John Sts.; cost, $8,000.
M. Fechelmer, two-st'y brick building, Park Ave., between Locust St. and Hamper Lane; cost, $4,000.
Frank Ewald, three-and-one-half-st'y brick building, 294 Linn St.; cost, $3,600.
A. Noterman, three-st'y brick building, Euclid Ave. and Moulten St.; cost, $3,500.
W. C. Harrison, three-st'y brick building, McMillan St. and Gilbert Ave.; cost, $8,000.
W. B. Taylor, three-st'y frame building, Warsaw Pike, near Incline; cost, $2,000.
Total cost to date, $164,886.
Cost of 14 repairs, $60,585.

Kansas City, Mo.

Building Permits. — B. S. Hayes, brick house, cor. Eighteenth and Woodland Aves.; cost, $9,000.
J. R. Hartzell, 5 frame houses, East Seventeenth St.; cost, $14,000.
School Board, rebuild wing of Lathrop School, cor. Eighth and May Sts.; cost, $5,000.
Wm. Burke, frame block, Forest Ave.; cost, $10,000.
Weber Bros., business block, Boulevard; cost, $11,000.
S. Danziger, brick house, Tracy Ave.; cost, $7,500.
J. E. Fred, frame store and dwell., East Ninth St.; cost, $5,000.

Minneapolis, Minn.

Building Permits. — C. D. Haven, two-st'y wood dwell., n e cor. Fourth St. and Eleventh Ave., s e; cost, $3,500.
P. M. Warner, two-st'y wood dwell., e s Willow St., bet. Yale Pl. and Grant St.; cost, $8,000.
Mary A. Brown, two-st'y brick dwell., s s West Twenty-ninth St., bet. Blaisdell and Pleasant Aves.; cost, $4,200.
Minnesota Hospital College Society, three-st'y brick hospital n e cor. Sixth St. and Ninth Ave., s; cost, $25,000.
D. R. Wagner, two-st'y wood dwell., n e cor. Park Ave. and East Seventeenth St.; cost, $6,500.
Geo. Crocker, two-st'y wood dwell., s w Lindley Ave. and West Nineteenth St.; cost, $4,050.
Mrs. Simms, three-st'y wood dwell., e w s Thirteenth St., bet. First and Second Aves., s; cost, $6,500.
A. D. Eads, two-st'y wood dwell., s w s Colfax Ave., bet. Summit and Lindley Aves.; cost, $3,000.
L. E. Reid, three-st'y brick store, s e s Washington Ave., bet. Second and Third Aves., s; cost, $16,000.
Dania Hall Building Asso., four-st'y brick store and hall, n e cor. East Fifth St. and Cedar Ave., s; cost, $20,000.
P. J. Moran, two-st'y wood dwell., n w cor. Portland Ave. and East Twenty-fifth St.; cost, $3,000.
E. S. Carver, two-st'y wood dwell., e s Vine Pl. bet. Oak Grove and Ninth Sts., s; cost, $6,000.
Plymouth Congregational Church, brick addition to church, s cor. Nicollet Ave. and Eighth St., s; cost, $11,000.
Wm. Blakeman, three-st'y double brick store, s w cor. Plymouth Ave. and Fourth St.; cost, $10,000.
Erick Nelson, two-st'y wood dwell., w s Fifteenth Ave. bet. East Nineteenth and East Twentieth Sts.; cost, $3,000.
E. J. Buell, one-and-one-half-st'y wood dwell., w cor. East Emerson Ave. and West Twenty-seventh St.; cost, $4,800.
R. F. Hurlbut, three-st'y wood dwell., e s Park Ave., bet. East Twenty-second and East Twenty-fourth Sts.; cost, $12,000.
Jno. Abrahamson, two-st'y brick veneer dwell., s e cor. Eleventh Ave. and East Twenty-fourth St.; cost, $4,000.

New Haven.

Building Permits.—Following are the building permits issued since my last report: —
Liberty St., three-st'y frame dwell., 22' x 45'; cost, $3,000; owner, Edward McCabe.
Congress Ave., cor. Arch St., 3 two-st'y frame dwells., 23' x 46'; cost, $5,400; owner, C. A. Moeller.
Beers St., bet. Martin and Chapel Sts., two-st'y frame dwell., 25' x 50'; owner, T. J. Ackerman.
High St., bet. Elm and Chapel Sts., four-st'y stone building, slate roof, 100' x 100'; cost, $60,000; owner, Yale College; architect, J. C. Cady; builders, Chatfield & Grant.
Portsea St., 3 two-st'y frame dwells., 16' x 36'; cost, $3,500; owner, Thomas Trowbridge.
Davenport Ave., two-st'y brick dwell., 21' x 32'; owner, L. C. Bunnell.
Hotchkiss St., 2 two-st'y frame dwells., 20' x 40'; cost, $4,000; owner, J. Gibbs Smith.
Grand St., near Blatchley Ave., two-st'y frame dwell., 23' x 36'; owners, S. R. & C. C. Blatchley.
Green St., brick building, two flats, 24' x 52'; cost, $4,000; owner, L. R. Johnson.
Derby Ave., near Athletic Grounds, two-st'y brick dwell.; cost, $5,000; owner, C. S. Redfield; architect, C. H. Stilson.

New York.

Factory.—At Nos. 130 and 132 Mulberry St., a six-st'y factory is to be built by Mr. Adam Munch.
Flats.—*Seventy-first St.*, n e, between First and Second Aves., 4 five-st'y brick, stone and terra-cotta tenements are to be built by Mr. Max Donzigor, at a cost of about $72,000; architect, Mr. John C. Burne.
Hospital.—It is reported that the hospital on Tenth Ave., between Fifty-ninth and Sixtieth St., is to be estimated on shortly, but the funds on hand hardly warrant a fire-proof building, which is wished for; Mr. W. Wheeler Smith, is the architect.
Tenements.—On the s w cor. of First Ave. and Ninety-second St., four tenements are to be built by Messrs. E. & E. Johnston, at a cost of about $50,000, from plans of Messrs. A. B. Ogden & Sons.

Building Permits. — *Seventy-fourth St.*, n e cor. Eleventh Ave., 19 three-st'y brick dwells., brick and brown-stone fronts, flat tin roofs; cost, $14,500 each; owners, Wm. E. D. Stokes, 37 Madison Ave., and Jacob Lawson, 48 Whitehall St.; architect, Wm. J. Merritt, 152 West One Hundred and Twenty-seventh St.
One Hundred and Sixty-fourth St., s s, 90' w Washington Ave., 4 two-st'y frame dwells., flat tin roofs; cost, $3,500 each; owner, Louis Falk, 177 East One Hundred and Sixty-fifth St.; architect, Charles Churchill, 177 East One Hundred and Sixty-fifth St.
Cherry St., No. 320, five-st'y brick tenement-house, flat tin roof; cost, $15,000; owner, Charles H. Reed, 310 East Sixty-ninth St.; architect, Chas. Rentz, 80 Greenwich St.
Ave. B, n e cor. Eighth St., four and five st'y school and lodging-house, peak and mansard roof covered with iron fire-proof blocks, slate and tin; cost, $49,000; owner, Children's Aid Society, 24 St. Mark's Place; architects, Vaux & Radford, 76 Bible House.
Cherry St., Nos. 297 *and* 299, six-st'y brick store-building, brick, granite and bluestone front, flat tin roof; cost, $65,000; owner, Amos Morrill, 202 and 204 Canal St.; architect, Albert Wagner, 67 University Pl.
First Ave., s w cor. Ninety-second St., 2 five-st'y brick tenements, flat tin roofs; cost, $28,000; owner, Emeline and Elizabeth Johnson, 51 and 53 East Ninety-first St.; architects, A. B. Ogden & Son, 409 East Fifty-third St.
Ninety-second St., s s, 63' w First Ave., 2 five-st'y and 1 one-st'y store and tenements, flat tin roof; cost, $26,000; owners and architects, same as last.
Fifty-fifth St., s s, 150' e First Ave., two-st'y brick boiler-house, flat tin roof; cost, $10,000.
One Hundred and Thirty-third St., Nos. 1 *and* 3, two-st'y and attic brick stable, flat tin roof; cost, $35,000; owner, James Everard, 12 East One Hundred and Thirty-third St.; architect, Geo. Edward Harding, 40 Exchange Pl.
Lexington Ave., w s, 42' s Seventy-second St., four-st'y brick dwell., flat tin roof; cost, $15,000; owners, Breen & Nason, 341 and 343 East Fifty-ninth St.; mason, Geo. W. Hughes, 138 West Fifty-third St.
One Hundred and Thirty-first St., n s, 125' w Seventh Ave., and *One Hundred and Thirty-second St.*, s s, 125' w Seventh Ave., 18 three-st'y and basement brick dwells., brown-stone fronts, flat tin roofs; cost, $216,000; owner, Isaac E. Wright, 1983 Madison Ave.; architects, Cleverdon & Putzell.
Third Ave., w s, 50' s One Hundred and Sixty-ninth St., three-st'y brick dwell., flat tin roof; cost, $5,000; owner, Christian Wetzell, 1295 North Third Ave.; architect, Chas. Churchill, 777 East One Hundred and Sixty-fifth St.
Mulberry St., No. 180, five-st'y brick tenement, flat tin roof; cost, $12,000; owner, Patrick J. Carroll, 128 East One Hundred and Twenty-second St.
One Hundred and Sixty-fifth St., s s, 66' w Delmonico Pl., Morrisania, two-st'y frame dwell., flat tin roof; cost, $3,700; owner, H M. Wittenbroch, 300 East Seventy-first St.; architect, Wm. Kusche, 633 East One Hundred and Thirty-ninth St.
Park St., No. 15, five-st'y brick lithographing and printing-house, flat tin roof; cost, about $60,000; owner, Robert M. Donaldson, 103 East Seventy-first St.; architect, R. H. Robertson, 121 East Twenty-third St.
One Hundred and Forty-fifth St., n s, 200' w St. Ann's Ave., four-st'y brick tenement, flat tin roof; cost, $12,000; owner, Robert Schwend, 31 Lewis St.; architect, Adam Munch, 307 East One Hundred and Fifteenth St.
Alterations.—*Fifth Ave., No.* 432, to be altered for store and bachelors' apartments for Wm. W. Moser; cost, about $15,000; architect, R. N. Anderson.
One Hundred and Twenty-eighth St., n s, 100' e Eighth Ave., 3 apartment-houses, additional story each and extensions; cost, about $20,000; architects, Messrs. A. Zucker & Co.
Fifth Ave., to Madison Ave., Fiftieth to Fifty-first Sts., St. Patrick's Cathedral, stone spires, etc.; cost, $190,000; owners, Trustees St. Patrick's Cathedral, Hugh Moore, President, 261 Mulberry St.
East Twenty-third St., No. 115, four-st'y brick dwell., alterations; cost, $3,700; owner, Thomas W. Wheeler, 115 East Twenty-third St.; mason, John G. McMurray, 508 West Twenty-fourth St.
First Ave., No. 223, four-st'y brick dwell., addition; cost, $8,000; owner, J. Steigenwall, 199 First Ave.; architects, Alfred Zucker & Co., 364 Broadway.
Twenty-seventh St., Nos. 35 *and* 37, two-st'y brick dwell., brick extension, etc.; cost, $7,000; owners, John Stevenson & Co., New Rochelle; architect, M. C. Merritt, 1267 Broadway.
Grand St., No. 237, five-st'y brick manufactory, to be repaired; cost, $3,000; owner, Solomon Loeb, 37 East Thirty-eighth St.; architect, W. E. Woeshin, 237 Ave. B.
West Twenty-second St., No. 4, four-st'y brick dwell., addition.

Philadelphia.

Building Permits. — *Filbert St., Nos.* 917 *and* 919, five-st'y factory; Jas. B. Doyle, contractor.
York St., e Cedar St., 2 two-st'y dwells.; Andrew Hetzell, contractor.
Chester Ave., w Forty-eighth St., 2 two-st'y dwells.; Jas. D. Arthur, contractor.
Mascher St., s Lehigh Ave., one-st'y factory; Dickson Bros., contractors.
Seventh St., n w cor. Snyder Ave., one-st'y chapel; A. M. Greene & Co., contractors.
Leithgow St., Nos. 2443-45-47 *and* 49, 4 two-st'y dwells.; E. Schmidt, contractor.
Fifth St., No. 2327, two-st'y hall; Thos. McCarty, contractor.
Darien St., s Lehigham St., 13 two-st'y dwells.; Jas. Kennedy, owner.
Chester Ave., s Fifty-first St., two-st'y club-house; A. J. Mosely, contractor.
Alter St., w Twenty-first St., 6 two-st'y dwells.; W. H. March, owner.
Washington St., No. 327 (Whitehall), two-st'y factory; Jno. McDade, contractor.
Fleeson St., near Ridge Ave., 2 three-st'y dwells.; Samuel Righter, contractor.
Hoffman St., w Sixth St., 2 two-st'y dwells.; J. B. Conden, owner.
Richfield St., w Twelfth St., 7 two-st'y dwells.; Hiram Miller, owner.
Darien St., n Huntingdon St., 6 two-st'y dwells.; Brocklehurst & Ewing, owners.
Willow St., above Harrison St., 2 two-st'y dwells.; Wm. W. Worrell, contractor.
Forty-ninth St., near Paschall Ave., 10 two-st'y dwells.; Isaac Wood, owner.
Twenty-seventh St., bet. Harold and Showaker St.; 3 two-st'y dwells.; Henry Schultz, contractor.
Berks St., w Eighteenth St., 5 three-st'y dwells.; Jno. L. Kales, owner.
Thirty-ninth St., cor. Parrish St., 6 two-st'y dwells.; W. J. Shedwick, owner.
Forty-fifth St., n Lancaster Ave., 7 two-st'y dwells.; Jas. Bateson, Jr., owner.
Emerald St., n Tioga St., 5 two-st'y dwells.; E. J. Develin, owner.
Lancaster Ave., w Fifty-third St., 4 three-st'y dwells.; Chas. Christine, owner.
Sixth St., s Cambria St., 2 two-st'y dwells.; Milton Snyder, owner.
Berks St., w Tenth St., addition to Globe Market; D. C. Schula, contractor.
Orianna St., n York St., three-st'y factory; D. C. Schula, contractor.
Cambria St., w Twenty-second St., 2 two-st'y dwells.; Chas. Campbell, contractor.

St. Louis.

Building Permits. — Forty-eight permits have been issued since our last report, eleven of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—
Mrs. M. P. Ramsey, two-st'y frame dwell.; cost, $5,000; sub-let.
F. Feger, 2 adjacent two-st'y brick dwells.; cost, $5,000; Henry Schurman, contractor.
B. M. Proetz, 2 adjacent two-st'y brick dwells.; cost, $5,200; B. M. Proetz, contractor.
W. J. Hegel, two-st'y brick dwell.; cost, $19,000; Capitain, architect; W. J. Hegel, contractor.
W. Graham, two-st'y brick dwell.; cost, $4,000; C. K. Ramsey, architect; sub-let.
L. H. Rumsey, two-st'y brick dwell.; cost, $3,000; L. H. Rumsey, contractor.
St. Louis Mutual House Building Co., No. 3, two-st'y brick dwell.; cost, $3,726; E. Mortimer, architect; J. Gager, contractor.
St. Louis Mutual House Building Co., No. 3, two-st'y brick store and dwell.; cost, $2,500; E. Mortimer, architect; Wm. Ihlo, contractor.
Fred. Brinkmeyer, two-st'y brick dwell.; cost, $3,000; P. Tieman, contractor.
John Farrell, two-st'y brick tenement; cost, $3,000; J. Farrell, contractor.
Barnett & Duffner, two-st'y brick dwell.; cost, $3,000; Barnett & Duffner, contractors.
Geo. Arnold, two-st'y brick dwell.; cost, $3,300; T. F. Marley, contractor.
E. Hurtman, two-st'y brick dwell.; cost, $3,000; A. Druiding, architect; Barnett & Duffner, contractors.
Mo. Street Railway Co., one-st'y brick car stable; cost, $15,000; Milburn & Rich, contractors.
Abner Cooper, 9 adjacent two-st'y stone and brick dwells.; cost, $18,000; Abner Cooper, contractor.

St. Paul, Minn.

Building Permits. — Three-st'y brick double store, n s of Fifth St., between Cedar and Minnesota Sts.; cost, $16,000; owner, F. B. Clark.
Two-st'y frame dwell., n s of Conway St., between Bates and Maple Sts.; cost, $25,000; owner, J. H. Cram.
Two-st'y brick veneer double dwell., n s of Selby Ave., between Macknbin and Kent Sts.; cost, $5,000; owner, H. J. McAfee.
One-st'y brick veneer passenger-depot, w s of Chestnut St., between Chestnut and Walnut Sts.; Sts.; cost, $5,000; owners, C. M. & St. Paul Railway Co.
Additional story to four-st'y brick hotel and stores, n s of Fifth St., between Wabasha and Cedar Sts.; cost, $6,000; owner, A. R. Carpshart.
Two-st'y frame dwell., e s of Simpson St., between Wesley and Capitol Sts.; cost, $2,000; owner, J. P. Rossman.
Four-st'y brick manufacturing building, w s of Wakunta St., between Third and Fourth Sts.; cost, $12,000; owner, Northwestern Paint Works.
Two-st'y frame dwell., s s of Jenks St., between Walsh and Welde Sts.; cost, $22,000; owner, Miss Emily Kaysas.
Two-st'y frame dwell., w s of Brewster St., between Bianca and Winter Sts.; cost, $16,000; owner, Mrs. A. McCann.
Three-st'y brick medical college, e s of Ninth St., between Font and Exchange Sts.; cost, $10,000; owners, College Building Association.

General Notes.

Allentown, Pa.—It is said on trustworthy authority that stacks Nos. 3 and 4 of the Allentown Iron Works will shortly be torn down and another furnace equal to the capacity of the two stacks erected in their stead.
Binghamton, N. Y.—French flats, three-st'y brick, 42' x 70', for Dr. C. C. Edwards; cost, $6,000; Palliser, Palliser & Co., architects, New York.
Bridgeport, Conn.—F. Egge, frame house, 35' x 50', Park Ave.; cost, $4,500.
L. Held, 4 cottages, Gregory St.; cost, $9,000.
The Naugatuck Valley Ice Co., three-st'y brick business block, cor. Middle and Golden Hill Sts., 60' x 86'; cost, $12,000.
J. Rollins, two-st'y frame cottage, Clinton Ave.; cost, $3,500.
F. L. Hitchcock, cottage, Hough Ave.; cost, $4,000; Palliser, Palliser & Co., architects, New York.
Bristol, N. H.—Lieut. J. B. Murdock, U. S. N., will build a summer residence on Murray Hill.
Burr Oak, Kans.—J. B. Wilbur, house; from plans by Palliser, Palliser & Co., New York.
Danbury, Conn.—The erection of the United Bank Building by the Union Dime Savings and National Pahquioque Banks has been commenced from plans

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 512.

OCTOBER 17, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE people of Boston, not through any fault of their architects, seem to be particularly unfortunate in their management of competitions. With the best possible intentions, joined to an exemplary liberality, their building-committees and other persons in authority seem to fail in securing that good-will from the profession which they are apparently anxious to deserve. Every one remembers the curious miscarriage of the Public-Library competition, and the management of that for the Suffolk County Court-House, which has recently been decided, seems to have just missed the perfect candor and fidelity to programme which are essential to success. It seems that a month or more ago the commissioners for building the new court-house invited pencil sketches, in a preliminary competition, promising, in their printed invitation, that the authors of the best sketches, not exceeding ten in number, should be paid one thousand dollars each, on condition of presenting new drawings at a larger scale in a final competition, the prize in which should be the execution of the building at the usual compensation. A professional expert was, as the document promised, to be consulted in judging as to the merit of the drawings, and the programme, which, as we are informed, was drawn up under the advice of an architect, was in general a model of its kind. As a natural result, many of the best architects in the city, who rarely condescend to meddle with public competitions, sent plans, and more professional skill was probably represented in the commissioners' rooms on the day appointed for receiving the drawings than had ever been called together before in Boston. One of the plans, however, prepared by a gentleman who, as city architect, had in years past given much study to the problem, was adjudged to be so much superior to any other that, in the opinion of the commissioners, no further trial was necessary, and a report was drawn up to this effect, recommending, however, that five hundred dollars each should be paid to nine other architects, whose designs showed special merit, as a sort of compensation for the trouble they had had.

UNDOUBTEDLY the Commissioners thought that they had not only secured an excellent plan, but had been particularly gracious to the other competing architects, in giving nine of them five hundred dollars outright, without requiring them to make any further plans; and if they had asked the assent of the competitors to this change in the programme, it would probably have been given with the utmost readiness. Unfortunately, however, this preliminary was forgotten, and one of the competitors thought proper to subject the Commissioners to a rebuke which was not wholly undeserved, by filing a bill in the Supreme Court, praying that the Commissioners should be restrained by injunction from employing the winner in the preliminary competition as architect of the building, and should be ordered to reopen the matter, and allow the architects who had been awarded premiums to enter into a second and final competition, according to the terms of the programme. There can, under the circumstances, hardly be a doubt as to the result of the second competition, as the objecting architects knew, but, believing that an important principle was involved, they put themselves forward as champions of the profession against the practice of violating the agreements implied in competition programmes, and as such we think that they are entitled to the sympathy and active support of all architects. That no suspicion of bad faith or discourtesy is breathed against the Commissioners makes no difference in the question, although the mutual respect and good feeling which exists between them and the architects ought to do much to facilitate its settlement; the principle that the objecting architects wish to defend, that those who issue a programme of competition have no right to set aside or vary any of its provisions at their own pleasure, is just as important in cases where all parties desire to act fairly as where barefaced treachery is attempted on one side. We need not point out that it is as easy for a layman to do injustice to competing architects through benevolent ignorance as by fraudulent intention, and the only way in which either party can make sure of neither wronging or being wronged is to have the clearest possible stipulations prepared beforehand, and to follow them out with scrupulous exactness. A general recognition of this principle, such as would follow from the decree of a court of record in a case like the present, would be as advantageous to the public which owns the buildings designed in competition as for the architects who compete for them, since a knowledge that the programme, once published, could not be varied, would make committees much more careful in drawing them up, and thereby avoid such fiascos as the Library competition, while the better class of architects, sure of being treated according to agreement, would enter far more freely into such contests than they now do.

WE wish we could always think that the excellent directions issued from the Bureau of Buildings in New York were sure to be enforced with the same intelligence that is displayed in devising them, but there are so many ways, known to the citizens of the metropolis, for evading the salutary regulations which are so liberally promulgated for their benefit, that we are sometimes inclined to believe that a little less precept, and a little more vigorous enforcement of the rules already existing, would be on the whole the best discipline for the unruly New York builders and owners of buildings. The last set of regulations issued from the Bureau relates to elevators. According to these, one of the deputy inspectors of the Bureau is to be detailed as special inspector of elevators, and is charged to see that the rules are observed. Manufacturers of elevators are to be compelled to furnish to the Bureau lists of all elevators made by them, and of the buildings in which they are placed; and no elevator is to be used until it has been inspected and approved. Every passenger-elevator must have the weight it can carry displayed in a conspicuous place, on a metal plate with raised letters, and the inspector is to examine every elevator at least once in three months, and report upon its condition. In case of any break or defect notice is to be given at the Bureau, and the elevator is not to be used again until written permission has been obtained. No person is to be employed to run an elevator who shall not be sober and trustworthy, at least eighteen years old, and qualified for his work by at least one month's training under the instruction of a competent person. Every elevator-boy must thoroughly overhaul his elevator once in twenty-four hours, and if any one is found to be incompetent or disqualified the Bureau will advise his employer, "upon whom thenceforward the responsibility for his acts shall rest."

THE last is the most singular clause in the whole document. Considering that the responsibility for the acts of elevator-boys now rests wholly upon their employers, we must infer from it that hereafter the State of New York intends to assume the responsibility for those of all elevator-boys more than eighteen years of age and of sober and trustworthy character; so that when a passenger in an elevator has his neck broken by being dropped from the top of a building by the carelessness of the boy, his heirs can only recover damages from the owner of the elevator by first proving that the Building Bureau had advised him that his boy was "incompetent or disqualified." This, we imagine, would be a more comfortable arrangement

for elevator-owners than for the tax-payers, who will, we suppose, be called upon to answer the demand which the owner succeeds in avoiding. The regulation that passenger-elevators shall have the weight they can carry noted in a conspicuous place reminds us of the little comedy which is played in most of the warehouses where, in accordance with a similar rule, the weight which the floors will safely bear is indicated in bold letters in different portions of the building; but in the case of elevators it is possible that the determination of the safe weight may be left to the calculation of the inspector instead of the bold guessing of the proprietor. The trouble would seem to be, however, that, as the weight which an elevator can safely carry depends mostly upon the strength of the hoisting-rope, the "metal plate with raised letters" ought to be changed, or at least criticised, with every change in the rope, while, as the rope deteriorates rapidly with use, the plate should show the minimum strain which it should be allowed to endure before being condemned altogether by the inspector.

A RATHER singular accident took place a few days ago in Chicago, where a four-story brick building collapsed, early one morning, the whole interior falling into the cellar. The weakness of the structure was first observed by a boy, who saw a movement in the wall, and told the engineer, but was laughed at for his pains. Soon afterward, however, an alarm was raised, and all the persons in the building succeeded in escaping before it fell. The cause of the catastrophe is said to have been the dry-rotting of the wooden girders where they rested upon the posts. The building had been examined not long before, and pronounced safe, and it seems possible that the rotting of the timber may have been caused by painting it while green, and that the same coat of paint may have served to conceal the ravages of the fungus from those who inspected the work. Paint, which prevents the drying of the corruptible sap of green timber, is a common cause of decay, while the contact of the end grain of one piece with the side of another, as in the case of a girder resting on a post, is an equally common one, so that the safest way in buildings framed with such timbers is always to rest the horizontal pieces on iron caps or brackets, and to avoid painting until the work has become seasoned by years of use.

THE great engineering sensation of the past week seems to have been the great submarine blast at Flood Rock reef, in the East River branch of New York Harbor, which has destroyed the last obstruction to the navigation of the river, and will, when the débris is cleared away, open Long Island Sound forever to the largest vessels which enter and leave the port of New York. Ever since the settlement of the city, the narrow and dangerous passage known by the significant name of Hell Gate has been the subject of much thought and no small amount of practical effort. Although deep enough in the channel, the natural passage is tortuous, and is rendered tenfold more dangerous by the violence of the tide, which, coming on one side from Long Island Sound, and on the other from the broad expanse of the harbor, forces itself through the narrow opening with extraordinary force. So swift is the current that the prisoners on Randall's and Blackwell's Islands, in the middle of the stream, are allowed to go, almost unguarded, to the very edge of the water, within easy hearing of the voices of their friends on the main land; the knowledge that no one, not of almost superhuman strength, could reach the other shore alive, serving to prevent any attempts at escape by swimming. The swiftness of the current was rendered more dangerous to navigation by the presence of several reefs and ledges, almost in the middle of it, which threw the stream into eddies against which even the most powerful steamers at times struggled with difficulty, and served to wreck innumerable smaller craft; so that long ago a subscription was raised among the owners of vessels in New York to improve the channel by private enterprise. A good deal was done in this way, but private individuals in such cases work at a disadvantage, and the United States Government at last undertook the task of clearing the passage permanently and effectually. For this purpose, after some minor operations upon the smaller reefs, the two greatest obstructions, Hallett's Point Reef and Flood Rock, were attacked by submarine mining on a grand scale. The Hallett's Point Reef was first removed, by means of ten tunnels, extending, with their cross galleries, to a length of about a mile and a half. These were charged with something more than fifty-two thousand pounds of dynamite, which was fired on a Sunday morning in September, 1876, to the great terror of the people on the neighboring shores, who were assured by sundry wiseacres that the explosion would cause a destructive earthquake in the city. The blast was completely successful, and operations were immediately commenced on a much larger scale against Flood Rock, a ledge of hard hornblende gneiss, covering about eight acres of ground, and appearing in some places above high water. The first work was to build a little platform of broken stone on the highest part of the rock, to give a site for the necessary buildings; and a shaft was then sunk at this point to a depth of sixty-seven feet. An auxiliary shaft was sunk close by, for supplying air, while the main shaft was used for removing the rock excavated from the headings. About four miles of tunnels were driven, the longest single heading being twelve hundred feet, and the system extending everywhere to within a distance from the surface of the rock varying from ten to twenty-five feet. About eighty thousand cubic yards of rock were removed from the tunnels before they were ready for the explosion. The next step was to drill in the walls of the tunnels thirteen thousand two hundred and eighty-six holes, each three inches in diameter and nine feet deep, in which were placed forty-seven thousand dynamite cartridges, containing in all about two hundred and eighty-five thousand pounds of the explosive. The cartridges were connected by about a hundred miles of wire, and, just before firing, the excavations were flooded with water by means of a siphon, with the object of securing the distribution of the explosive force by means of the incompressible fluid. The current for firing the charge was sent from the Long Island shore, and the detonation seems to have been complete, the whole ledge, so far as has yet been learned, having been broken into loose fragments, which will be easily removed with a dredge to a deep part of the channel, where they will be out of the way. When this is done, a clear channel, twenty-six and one-half feet deep at low water, and fifteen hundred feet wide, will be open into Long Island Sound, and the course of navigation in New York Harbor will be very sensibly changed.

MANY young architects will be relieved to have a question answered which often troubles them and their clients. A letter written to the law editor of *La Semaine des Constructeurs* describes a case where a contract was made for building a house between party-walls already existing. The new house was higher than the others, and it was necessary to build upon the party-walls. The extra height of wall was indicated on the drawings, with a thickness shown by scale only at twenty inches, which is a common thickness for stone party-walls. The specification said that the party-walls were to be "continued" to the height of the new building. After the completion of the party-walls, it was found that they were originally only fifteen inches thick instead of twenty, and had been carried up of the same thickness. A claim was then made upon the contractor for an allowance of the difference in value between a fifteen and a twenty-inch wall of the height shown. He denied the justice of the claim, and the case was referred to *La Semaine*, which decides unhesitatingly in favor of the contractor. It is the law in France, as it is common to stipulate in contracts everywhere, that a contractor for a building at a fixed price cannot demand extra payment on account of any changes or additions whatever which have not been ordered in writing, and the price of them agreed to by the owner; and the editor says that both in law and justice this rule, which usually works to the disadvantage of the contractor, applies also to cases where it brings him some advantage; and that unless a written order had been given for reducing the thickness of the extension of the party-walls from the specified dimensions, and an allowance agreed upon by both parties before commencing the work, nothing could be claimed by the owner for the saving so effected. In the present case we doubt whether the specification, taken with the plan, which showed no figures for the thickness of the party-walls, although all other dimensions were figured, could be regarded as requiring the contractor to build the upper portion of the party-walls thicker than the substructure, so that it is at least uncertain whether an allowance could have been required, even if a written order had been given for the variations from the scale dimensions of the plan; but without such order a claim of the kind would be totally inadmissible.

NOTES FROM ENGLAND.

PETERBOROUGH. — GLOUCESTER. — DURHAM.



Old Chair. at Soldier's Carnival. Boston Mass. Ap. '85

PETERBOROUGH Cathedral, in the month of August which has just passed, was hardly in a condition to recommend itself to the tourist eye. As every one knows, the tower and its supports had been taken down, and were in mid-process of reconstruction. The nave and aisles were boarded off, a couple of bays west of the crossing, from pavement to arch-crown; and beyond the boards all seemed havoc and confusion. The choir was stripped of its portable fittings and the monuments covered over. The floors were spread about with the window traceries and the wooden groining of the lantern, which a throng of workmen were repairing against their re-insertion. The crossing itself was filled with the giant scaffolding, which straddled over vague hollows where the pavement should have been. And the things one could see were certainly not seen amid cathedral calm; what with the rattle and hiss of the steam-laborers, and the agonized warnings of vergers in one's ear — and outside, too, the effect was disastrous, for the long bulk of Peterborough suffers peculiarly from the absence of the tower — barely sufficient in its best estate to redeem it from an almost oppressive monotony.

But from another point of view there were compensations for the lack of quiet and of general effectiveness. I think, indeed, a student could not have chosen a better moment for his visit, since even to an amateur's eye there was great interest in the glimpse it got of ancient methods of construction and modern methods of reconstruction; and no student could ask for a better chance of entertainment or instruction than to come under the courteous guidance of Mr. Irvine (Mr. Pearson's clerk-of-the-works, and, if I mistake not, the same who in former years labored under Sir Gilbert Scott, and is well-known by the new lights his patient and intelligent observations have enabled him to throw upon the history of several important structures, and especially of the cathedral church at Wells). A clear explanation of the task now in hand was the least part of one's gain. The best part came when one passed with him from point to point of the mighty church, and received an object-lesson with regard to its fabric and its history, far more detailed, more exact, more lucid and unforgettable than could ever be gathered from printed pages. Indeed one had cause to be content that just this time and not another had seen one's visit to Peterborough.

I need hardly explain that after much discussion it was decided to rebuild the fourteenth-century tower practically as it had stood, and not to replace it with a more or less imaginative nineteenth-century imitation of its Norman predecessor. Certain minor points were still unsettled at the time of my visit: for example, whether or no there should be introduced above the Norman arches, to the north and south, an arcading of like style, for which good authority could be traced, I believe, in the more ancient parts of the fabric itself. But in general the tower is rebuilding in the old (that is to say, the *newer* fourteenth-century) way, and as far as practicable with the old stones each in its old station, only such alterations and substitutions being made as are essential to constructive excellence. The piles of carefully grouped and numbered stones which crowd the floor and the churchyard, and the re-erected walls as far as they have progressed, alike tell of the conscientious effort to *rebuild*, and not merely to "restore." The great angle piers were taken down entirely and the new foundations sunk to the rock itself below. This revealed itself sooner than had been looked for, at a depth of about ten feet beneath the floor, and, contrary to the architect's anticipations, no pumping was found necessary.

The beginning of August saw the great piers again in place, and, above them, the great arches also in place and freed of their centering — the Norman arches to the north and south, and to the east and west those pointed ones which for a time had seemed likely to get no such new lease of life. The obligation to rebuild has, I say, been conscientiously respected, yet not in a foolishly slavish way. Larger bonding-stones are inserted here and there among the small stones which alone made up the walls, and a more interesting alteration is to be noted in the great Roman arches. The old voussoirs were of like size throughout and small, one for one to each chevron of the intrados moulding. Now the lower voussoirs on either hand up to the actual starting of the curve (for the arches are stilted) have been replaced by others, fewer and larger, with horizontal instead of the old inclined beds.

It was interesting to examine the old lantern-ribs which were in process of repair, and to find how nearly perfect they were after their five hundred years of service. Even where their surface looked most spongy the damage was often but skin-deep, and a couple of shallow chippings showed the wood as solid as new. The patches are but small and usually but superficial, by the aid of which we are promised they will stand for four or five centuries to come. And almost as much may be said of the beams and joists of the transept ceilings, which are older still. Their early twelfth-century origin is well authenticated, and the flat boarding beneath them had been supposed to be of quite equal antiquity. Its well-preserved, lozenge-patterned, painted decoration is of Norman design, and it had never been disturbed, as had the similar ceiling of the nave, which was canted when the pointed arch was introduced to support the fourteenth-century tower. But discoveries may be expected when a flood of light is poured into dark and secret places. As I stood on the last-laid course of stone above the southern tower-arch, the south transept ceiling could be examined at close quarters from above, and even an unpractised eye could see what the architect pointed out: traces, both on the great transverse beams and on the smaller joists, which proved that, great as is its age, the present boarding had been preceded by another, laid not below but *above* the framework. The ceiling must perforce come down for repairs, and it is possible that traces of the veritable first painting may then be found on the under surfaces of beams and joists.

Nor is this the only discovery that the restorers have made. Beneath the crossing they have come upon a narrow passage leading to a small chamber, which, it is guessed, was used in the earlier days of the church, for the safe-keeping of the altar valuables; and upon another cavity which seems to have been a portion of the Saxon church, perhaps of its crypt. But a systematic excavation has not yet been made, and all such opinions are but guesses for the moment. Beneath the flooring, or built into the pier foundations, were found a number of interesting sculptured fragments of various kinds and dates. I noted especially a small sepulchral slab, apparently ante-Norman, decorated with scrolls and a curiously-complex cross, imitated, perchance, from an embroidered pall; a small capital, quite Classic in feeling, which had been hollowed out to form a rest for the head of an entombed body; and a large bit of indisputably Classic workmanship. This had been the drum of an attached column, and was ornamented with upright sprays of leafage. Its origin may easily be guessed, for at Castor, four miles to the west of Peterborough, may still be traced the remains of a Roman station. Most curious of all, however, was a discovery made, not beneath the ground, but high above it. Two of the stones which formed the plain, cushion-shaped capital of the great southeast pier, showed by the fashioning of their inner ends that, in a reverse position, they had done similar service in an earlier work. Since they had thus twice been put to use, and since, moreover, the hidden carving was of great intrinsic interest, I think even the most rigid advocate of rebuilding will agree that it was wise to preserve them as fragments and cut others to fill their place. One, which was mutilated, showed remains of figures, and the other, in better preservation, a sort of honeysuckle design, beautifully executed and distinctly Classic in feeling. The first (and much more ornamental) service of these twice-utilized stones was doubtless in Ernulph's church, destroyed by fire in the year 1116, and replaced by the structure of which such large portions remain to the present day. Built into the south-eastern angle of the chancel of the charming and charmingly-situated little (partly Norman) church at Fletton, a couple of miles away, are fragments of sculpture which plainly were adapted to, not created for, their position. Upon some of them the traces of fire are very apparent, and it is a matter of record, moreover, that they were brought from the ruins of the burned church of Peterborough. They may be compared with the newly-discovered capital-stones to prove the origin of these. And the evidence of all is interesting as a proof that priority of date did not always denote greater simplicity of decoration.

I need hardly refer to what has been enlarged upon so often with Peterborough as a text: the bad methods of construction sometimes used in ages which it is the custom to hold up as impeccable models to our own degenerate times. But to see such things is to realize them, and to realize them is to marvel, not that portions of the church have so long been decrepit, but that much of it should have survived at all. For example, where certain small repairs were in process of execution on the choir piers, and the thickness of their casing was consequently revealed, it appeared like a mere skin: eleven inches of good stone around a huge bulk of carelessly filled-in stuff, "sometimes better in character," as my guide averred, "and sometimes worse, but always bad enough;" and, he added, "the merit of continued existence has been due solely to the extraordinary excellence of the Barnack stone, which is quite unrivalled in its ability to stand a twisting strain. And yet in justice we should remember that the draining of the fen-country has put the structure through an unwontedly severe experience, for as the ground has dried, so it has consolidated and settled. Especially has the south transept been pulled about, owing to the slope of the ground beyond it, and it will probably have to be underpinned ere long.

Nor is it only in Peterborough's Norman work that defective construction shows itself. The famous great west porch is in a visibly dislocated condition—the north wall bulging, the north arch fractured, and the whole of the upper part braced and tied together—and the parvise which fills in the lower part of the central arch is believed to have been built as a necessary buttress, and this as early as 1370 — but a century and a half after the erection of the front. Which off-told tale I should not here repeat were it not that there has been much discussion of late with regard to the alleged dangerous condition of the front and the necessity that it too should be taken down and put up afresh. Should this eventually be done it seems as though there could be no opening for doubt that the strictest method of *rebuilding* would in this instance alone be advocated. Yet, when one knows what arbitrary excisions have been made from the fabric

of other English churches not so very many years ago, one would hardly be surprised did certain so-called purists clamor for the destruction of the fourteenth-century parvise in the central archway. The best thing to hope is that it may be many a long year before any one need tamper with what is perhaps the most splendid and imposing piece of pointed work in England—though by no means the purest, the most rational or the most in harmony with the size and the expression of adjacent parts.

It is not settled as yet whether the choir of the cathedral shall be left with its existent fittings, or shall be furnished anew. If—as so often in other churches — it were a question between fine and time-consecrated though "inappropriate" Renaissance fittings, and "appropriate" nineteenth-century-mediæval substitutions, one would certainly desire no change. But what now exist at Peterborough are elaborate, obtrusive and very hideous Gothic performances of the first part of our century, and upon these the work of to-day might well be an improvement.

Such stories have often been told of somewhat earlier days than ours, but I am tempted to tell one which shows that the "restorer" has not altogether ceased from foolish and wanton destruction. In Gloucester Cathedral a few weeks ago, I saw on the floor of one of the triforium chapels of the choir, a charmingly proportioned and delicately-carved Corinthian column of oak, with a few smaller fragments—all apparently the relics of what had once been a choir screen. Such they were in truth—relics of the organ screen removed in 1823, (replaced by a hideous heavy pseudo-Gothic structure which still stands,) and set up in the church at Cheltenham a few miles away. But this last in its turn recently came under the restorer's care, and the beautiful Renaissance work was once more ousted from its place. It was given back to its former donors, the Chapter of Gloucester, and as there was no particular use for it, it was *destroyed*, with the exception of the few pieces I saw. These were preserved as "relics," but they are witnesses also, and the Chapter would have done better for itself had it made firewood of them as well. It is a pity they did not turn a penny (more or less honest according to the view one takes of their responsibilities) by selling it to some trans-Atlantic amateur. The facts I repeat as the verger told them, and I suppose he was not misrepresenting his betters.

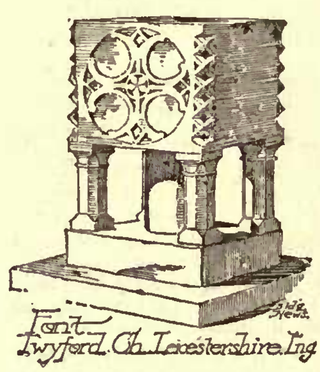
Speaking of the sculptures from the burned church at Peterborough reminds me to note for the benefit of future travellers a certain treasure at Durham which those pressed for time might easily miss seeing. Durham is exceptionally fortunate in that the Rev. Canon who fills the office of librarian to the Chapter is a wise and enthusiastic archæologist—is, indeed, a recognized authority in the highest rank of English antiquaries. His tender care of the great treasures in the library proper, his discovery of the long-forgotten tombs of Ralph Flambard and his brother bishops, his rarely excellent handbook to the cathedral church itself, the zeal and knowledge with which he seems to inspire all those who hold even the humblest office within its walls—to tell of all these would be far too long a chapter—I mean but to note a collection of sculptured stones (chiefly if not wholly sepulchral in origin) which Canon Greenwell has collected from various spots in the north (many of them from Hexham), and assembled at one end of the huge and splendid apartment that was once the dormitory, and is now the larger library. Though these monuments are evidently ante-Norman in date, they are of high intrinsic beauty, and from the nature and variety of their decorative patterns of the greatest historic value. Sometimes the stone shows one of those braided, interlaced or spiral patterns which have variously been called Saxon, Scandinavian, Celtic, "Runic;" which M. Viollet-le-Duc names Indo-European as having been the common possession of their ancestors ere Celt and Saxon were differentiated from one another; but which we might well consent to call Irish, as they reached their highest development, received their most artistic and finished expression in Irish MSS. of that early time, when British culture had its centre to the west and not to the east of St. George's Channel.[1] The ornamentation of other stones is Romanesque, but more analogous in feeling and motive to the types of Central Europe than to those which most commonly developed under the Norman chisel. And still other monuments show motives which are distinctly Classical—in certain cases I may say *purely* Classical, and use the word in both its meanings. These last seemed to me the most interesting of all, as proving how deep a root the Classic influence had struck in the farthest north, and how long it survived the introduction of alien tendencies. For that all these varieties of decoration flourished together is shown by their occasional juxtaposition on one and the same monument. The Classic survivals resemble, of course, those which in France are called Gallo-Roman; but, so far as my memory serves me for comparison, they are unusually good—firmer and more spirited in design than Gallo-Roman work is apt to be, sharper, more vigorous, more *vital* in execution. The rendering of Indo-European designs would tend, one may believe, to prevent the sculptor from falling into that soft, loose, characterless way of working which was so wide-spread before the renaissance of Classic art in its imported, eastern Romanesque development.

None of these sculptures in the Durham library have as yet been photographed, and I think a draughtsman would do good service who would reproduce them in sufficient number to show their varieties of style, and the way in which these varieties are sometimes associated together. At all events I advise every student-tourist to get the librarian's readily-accorded permission to see them. And I advise him also—whatever may have been his previous experience of the English verger, whatever he may have lacked or suffered at his hands—not to fail to make friends with Mr. Wetherell, the head-verger at Durham. His peripatetic expositions are very different from the ludicrous parodies of information one is too often absolutely compelled to listen to in other places. He is as intelligent in his ideas as he is well-up in his facts and lucid in his explanation of the one and the other. It is a pleasure to be able to note one great English church where the official guardian is equal to his duties, and where an admirable historical hand-book may be had for the shilling more commonly expended on gushing trash.

At Peterborough, too, I may add, there is a good hand-book to be had, written by a Mr. Craddock. It is a long way off from being as good as Canon Greenwell's of Durham, in so far as its architectural portion is concerned. But its purely historical chapters are as full and valuable as one could wish. Every visitor should by all means follow its advice and have a look at Castor, four miles away—not for the sake of its scanty Roman remains, but for the sake of its beautiful, cruciform parish church. The Norman tower over the crossing is intact, and it has many other admirable and unusual features. Whether or no (as Mr. Paley suggests in his remarks on Peterborough Cathedral) this tower preserves for us the likeness of the Norman tower which once stood on the greater church, it is an extremely beautiful piece of work—far more beautiful, it seemed to me, than the tower of Norwich Cathedral, because its arcaded ornamentation is more structural, more *architectural* in feeling than the panelling with which Norwich is adorned.

M. G. van Rensselaer.

TOMMASI-CRUDELI ON MALARIOUS COUNTRIES, AND THEIR RECLAMATION.[2]



DISMISSING from scientific terminology the words "marsh miasm" and "marsh soil," and replacing them by "malaria" and "malarious soil," the author traces the fever-poison thus indicated to "an agent which can infect the soil of any country, however that soil may differ from other soils in hydrographical and topographical conditions and geological composition."

This agent is a living organism inferred to exist long before microscopy. That its character should remain uniform in soils the most diverse proves that it cannot result from the chemical reaction of these soils. This persistent uniformity is easily understood on the admission that malaria is due to a fermentative organism which finds conditions favorable to its life, and its multiplication in soils the most various, as is the case with thousands of other organisms much higher than the rudimentary vegetations which constitute living ferments.

The increasing intensity of the poison in malarious soils abandoned to themselves is especially demonstrable in Italy. Etruscan and Latin cities — Rome herself — arose in malarious regions, and they flourished mainly on account of the soil reclamation, which in the course of centuries diminished the production of the poison, without, however, succeeding in wholly suppressing it. The abandonment of the reclaiming processes led to the redevelopment of the poison — first during the Roman domination in the conquered and devastated Etruria, afterward in Rome herself on the fall of the empire, and finally in Southern Italy. This redevelopment of malaria in the Roman Campagna has been witnessed in times not very remote from ours, localities where it was possible to enjoy summer residence (*villeggiatura*) having at that season become uninhabitable. In these localities the physical conditions of the soil have not varied for centuries; how, then, can the enormous increase of malaria be due to progressive alteration in the chemical constitution of the soil itself? Admit that malaria consists in a living organism whose successive generations infect to an ever-increasing extent the soil which contains it, and the explanation is easy.

Again, in regard to the malarious contents of the atmosphere. If the malarious ferment (*fermento malarico*) were composed of gaseous emanations from the soil, or of a chemical ferment formed in the soil and raised into the air together with watery vapor, the malarious contents of the atmosphere ought to reach their maximum in those hours when the soil is most warmed by the sun's rays, and in which the evaporation of the water it contains, and the chemical processes occurring within it are at their greatest intensity. But it is not so. The malarious contents of the local atmosphere are less in the noonday hours than at the beginning and close of the day—that is, after sunrise and, above all, after sunset. Now, it is exactly at these two periods of the day that the difference between the temperature of the lower strata of the atmosphere, and the temperature of the surface of the soil is greatest, and that the currents of air which ascend vertically from the soil into the upper atmosphere are at their strongest.

[2] Abstract, by the *Lancet*, from an article published in the *Nuova Antologia*.

Admitting that the malaria is formed of solid particles of low specific gravity (such as are the germs of the inferior vegetations), we see at once how it ought to accumulate in the lower strata of the atmosphere, especially in those two periods of the day.

The tendency among investigators has always been to attribute this specific poisoning of the air to a living organism which multiplies in the soil; but, unfortunately, the "palustral prejudice," as Dr. Tommasi-Crudeli calls it, has led them to examine only the lower organisms which haunt marshes. In 1879 the author, in conjunction with Dr. Klebs, discovered the cause of malaria in a "schizomyces bacillaris," and recently Drs. Marchiafava and Celli have demonstrated that this parasite attacks directly the globules of the blood and destroys them after having determined in them a series of characteristic alterations, which indicate quite certainly the existence of a malarious infection. "Many observations," says the author, "just completed in Rome, would tend to demonstrate that this parasite does not invariably assume the bacillary form described by Klebs and myself; but this purely morphological question need not concern the practical hygienist. For him it is essential to know that he has to deal with a living ferment which can flourish in soils the most diverse in composition, and without the presence of which neither marshes nor pools of putrescent water are capable of producing malaria."

Having incidentally shown that soils may contain this parasite in an inert state and not produce malaria till the circumstances favorable to its activity have arisen, Dr. Tommasi-Crudeli proceeds to demonstrate that among the conditions which assist the development of the malarious ferment contained in the soil and the excessive air accumulation of that ferment in the air, there are three of primary importance, as their concurrence is indispensable to the production of malaria. These are (1), a temperature not lower than 20° Centigrade [68° F.]; (2), a moderate degree of permanent humidity in the malarious soil; and (3), the direct action of the oxygen of the air on the strata of the soil which contains the ferment. If one only of these three conditions be wanting, the development of malaria becomes impossible. Now, this is an important point in the natural history of malaria, as giving us the key to the chief part of the soil reclamation attempted by man.

First, let us take Nature's amelioration of the malarious countries, suspending as she does for a longer or shorter time the production of malaria. Winter, for example, causes in all these countries a purely thermic amelioration—that is, it suspends the production of malaria simply by making the temperature fall below the minimum required for the development of the poison. In fact, there are often, even in winter, sudden outbreaks of malaria when a sirocco wind raises the temperature above this minimum. Again, during a very warm and dry summer, malaria is not developed, because the sun's rays have exhausted the humidity of the soil, so producing a purely hydraulic amelioration, which, as in the Roman Campagna in 1881–82, may last for a considerable time; easily to be dissipated, however, by one steady shower. Finally, there may occur in nature purely atmospheric ameliorations, when the surface of the malarious soil is withdrawn from the direct action of the oxygen of the air by means of natural earth-coverings formed by alluvial deposits of healthy soil, or by means of the "earth-felt" wrought up from the soil by the roots of herbage in a natural meadow.

In their various attempts to suspend the development of malaria from the soil, men have tried to imitate Nature — to eliminate, that is to say, one of the three conditions indispensable to the multiplication of the specific ferment contained in that soil. Naturally enough, they have never attempted thermic ameliorations, such as Nature effects in winter, because it is not in their power to control the sun's rays. They have had to restrict their efforts to either hydraulic or atmospheric ameliorations; but sometimes they have succeeded in happily combining the one and the other, that is, in eliminating at once the humidity of the soil and the direct action of the oxygen of the air upon it.

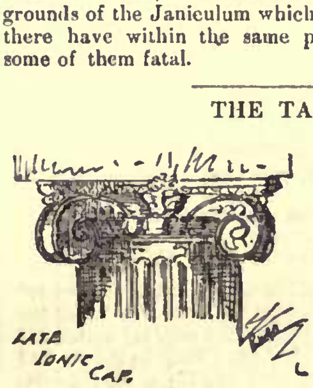
Hydraulic amelioration has assumed many forms, according to the nature and site of the malarious soil. Drainage, in which the ancient Romans excelled us, has been practised in Italy, both in deep and friable soils and in subsoils compact and almost impermeable, in which latter the "cunicular" drains of the Etruscans, Latins, Volscians and Romans might even nowadays be studied with advantage.

Sometimes a twofold drainage of the upper, as well as the under aspect of the soil may be practised; that is, draining the subsoil and increasing the evaporation of the surface water. The cutting down of forests in malarious countries has often proved an excellent means of amelioration; because, by removing every obstacle to the direct action of the sun's rays on the surface of the soil, its humidity during the warm season is sometimes entirely exhausted. In spite of universal experience of this fact, a school originating with the great Roman physician, Lancisi, has sustained the contrary, counseling the maintenance and even the extension of forests in malarious countries. Lancisi was completely possessed with the "palustral prejudice," and believed that the malaria generated in the Pontine Marshes, and attacking such townships as Cisterna, was intercepted, if only partially, by the forests between, and he therefore opposed the cutting-down of the trees, and recommended increased planting. He did not know that the malaria was already in the soil and covered by the forest in question. Some thirty years ago the Caetani family, to whom Cisterna belongs, cut down the forest, and twenty years thereafter Dr. Tommasi-Crudeli was able to show that the health of the neighborhood had greatly improved in consequence. A commission appointed by the Minister of Agriculture investigated the whole subject of the coexistence of woods with malaria, and in its report issued in 1884 completely disproved the theory of Lancisi and confirmed that of Dr. Tommasi-Crudeli.

Absorbent plants have been suggested and used as a means of drawing humidity from the soil, not without success in certain countries really malarious. The prejudice that the malaria is due to the putrescent decompositions of the soil has, in Italy, led to the choice of the *Eucalyptus globulus* as the tree best adapted to combat the poison, the idea being that the eucalyptus, which grows very rapidly, dries the humid earth, and at the same time by the aroma of its leaves destroys the so-called miasmata. No genuine instance of the eucalyptus having succeeded in its allotted task is yet known to Dr. Tommasi-Crudeli, though he does not say that its success is impossible. Had its Italian patrons studied its action in its native Australia, where it flourishes much better than in Italy, they would have known that there are eucalyptus forests in those latitudes where malaria is very prevalent, as has been shown by Professor Liversidge, of the University of Sydney. The cultivation of the tree at the Tre Fontane, near Rome, which it was thought would prove entirely successful in combating the local malaria, disappointed expectations, for in 1882 that hamlet was the scene of a severe outbreak of the fever, while the rest of the Campagna was unusually exempt from it. The eucalyptus, in fact, is a capricious tree in European soil; while in full leaf, during the winter, it is often killed by nocturnal frost, and even by the late frosts of spring, to say nothing of humid cold and other adverse influences not yet formulated by the botanist; again, when the winters are mild and the soil deep, it often shoots up rapidly, only to be snapped asunder by winds of moderate strength. Eucalyptus plantations, moreover, are very costly. If the ground is watery it has to be drained, otherwise the roots rot; if the ground is heavy, trenches must be dug in it to make room for the long roots of the trees, and often these trenches have to be drained, as is done in the case of olives, in order to prevent the filtration water from stagnating and the roots from rotting. Hydraulic amelioration must have recourse to means less uncertain; and should the conditions of any locality counsel a trial of an absorbent plantation, it should be done with trees of our own hemisphere. The expense is smaller, and the trees are sure not to die.

At best, hydraulic amelioration is never certain, because the slight humidity of the soil necessary to develop malaria may easily be restored to it, even during the warm season. Combination of atmospheric with hydraulic amelioration has therefore been tried: to withdraw, that is to say, the humidity from the soil, while at the same time preventing the direct contact of the air with its malarious strata. Leaving the soil with layers of sound earth spread over it either alluvially or by the hand of man, and also draining the soil itself, was last year, at the instance of Dr. Tommasi-Crudeli, practised on the grounds of the Janiculan Hill, near the Palazzo Salviati, in the Lungara. The entire area, having been thoroughly well drained and then covered with a dense coating of meadow soil in all those places which could not be paved with street rubble, has since remained without a single case of fever in the numerous personnel of the Military College occupying the Palazzo Salviati, while in the Palazzo Corsini, on the same side of the Lungara, but looking on the grounds of the Janiculum which are still exposed to the air and sun, there have within the same period been not a few cases of fever, some of them fatal.

THE TAY VIADUCT.



At the recent meeting of the British Association Mr. Crawford Barlow read a paper on the Tay Viaduct, which is being constructed at the side of, and 63 feet distant from, the Tay Bridge, which was destroyed in December, 1879. Its total length is 3,600 yards; the number of spans is 85, varying from 50 feet to 230 feet in length; the greatest height of rails above high water is 83 feet, and at the navigable channel in the middle of the river there is a clear headway of 77 feet for shipping.

The southern or Fife end of the viaduct consists of four arches of 50 feet spans with their abutments and piers, all built of brick. In plan this arching is wider at the southern than at the northern end, to accommodate a junction of the Newport branch with the main line.

The northern or Dundee end consists of seven spans over the Dundee esplanade and its proposed extension, the first two spans of which are wrought-iron skew-arches, to suit the direction of the intended esplanade, and the remaining are girders on brick piers and cast-iron columns.

The central portion of the viaduct, over the tidal water, has 74 spans, consisting of wrought-iron girders resting on piers. The cylinder foundations of the piers are constructed of wrought-iron caissons, with the exception of a few which are of cast-iron, up to low-water level, lined with brickwork and filled with concrete, above which is a brick shaft also filled with concrete; the diameter of their bases varies from ten feet to twenty-three feet, according to the

spans. Except in a few cases where rock is met with, the cylinders are sunk to a depth between twenty feet and thirty feet below the bed of the river, so as to be out of reach of the scouring action of the tide; and before building the upper part they are tested with a weight of thirty-three per cent more than the maximum load which can come upon them. At the top of the cylinders and above high water is a strong connecting piece, eight feet high, and nearly as wide as the diameter of the cylinders, constructed of cast-iron girders, wrought-iron ties, brickwork and concrete. Above this is the wrought-iron superstructure or shaft of the piers, consisting of two octagonal shafts rising from each cylinder, and attached to the same by long bolts; these shafts are joined together near the top of the pier by a semicircular arch forming at the top one structure. The whole is constructed of wrought-iron plates riveted together, with channel, tee and angle irons.

The dimensions of the girders are very various and are as follows:

11	spans with	245	feet	girders.
2	"	227	"	"
1	"	162	"	"
13	"	145	"	"
21	"	129	"	"
1	"	113	"	"
24	"	71	"	"
1	"	56	"	"

The thirteen large spans are near the middle of the river; each of these consists of a pair of hog-backed girders, the rails being laid between and at the bottom of them. The rest of the spans, twenty-four on the south side and thirty-seven on the north side, are constructed with four rectangular girders (the outer ones being the girders of the old bridge) on the top of which the rails are laid.

The flooring is corrugated in form throughout, and on each side of the viaduct is a wrought-iron lattice-work parapet, five feet high above rail level.

The Act of Parliament authorizing this undertaking was obtained in 1881, and the works were commenced in 1882.

The present state of the work is as follows:

The southern and northern ends are completed to the level of the railway, and at the central portion, or viaduct proper, fifty-eight piers have their cylinders sunk, twenty-nine piers have their wrought-iron shafts erected, and ten spans have the girders in position and are completed to the railway level. The girders and flooring for each of the thirteen large spans are being built entire on a staging at the south end of the viaduct, and arrangements are being made by which they will be floated out and placed in position on the cylinders, and then raised hydraulically to their proper position, the wrought-iron shafts of the piers being built up at the same time.

All the wrought-iron and steel required for the work is carefully tested, the tests being that the wrought-iron must be capable of bearing a tensile strain of twenty-two tons per square inch, with an extension of 6.25 per cent in a length of eight inches, and the steel twenty-seven tons per square inch, with an extension of 15 per cent.

In carrying this work into execution a great amount of plant has been required, and a number of ingenious machines and clever contrivances for the better execution of the work and the saving of labor have been devised and brought into operation by the contractors, Messrs. Wm. Arrol & Co.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

SECULAR TOWERS, MODERN.

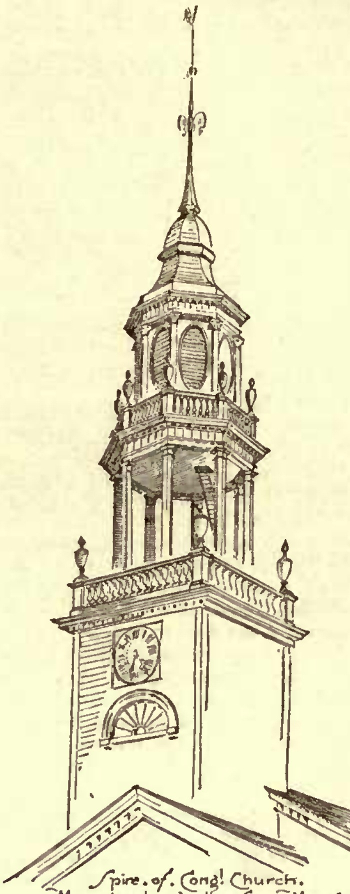
THE PULPIT IN THE CATHEDRAL, SIENA, ITALY.

INTERIOR OF THE BAPTISTERY, PISA, ITALY.

NOTE. — During the temporary absence of the editor a printer's blunder placed in this column in our issue for October 3, a paragraph, — intended for Notes and Clippings, — which recounted certain amusing fancies concerning Brumidi's decorations at the Capitol. Many demands having been made on us for the supposedly missing illustration it seems necessary to make this explanation.

THREATENED ABOLITION OF THE WASH-HOUSES ON THE SEINE.—The floating wash-houses, which form a striking feature in the panorama of the Seine in its course through Paris are menaced with suppression. The city engineers have demanded their removal, and the proposal is now under the consideration of a commission appointed by the prefect. The motive for the demand is the increasing traffic on the river. So long as the only navigation consisted of a few lighters, towed along the chain laid down in the channel, the wash-houses were no obstruction; but now that Paris has become a large trading port, the quays receiving seven hundred thousand tons of merchandise annually, the seventy wash-house boats moored along the banks form serious obstacles to the traffic, which has increased enormously during the last fifteen years by the running of passenger steamers, to the number of which will shortly be added those of a new company. Another objection—a hygienic one—is that the stream is polluted by the foul linen washed in the river above the point where the water is pumped at Passy for the public reservoirs, from which it is distributed to the houses for consumption.—*Exchange.*

CIRCULAR HOSPITAL WARDS.[1]



THE proposition for constructing hospital sick-wards upon what is known as the "Circular System," was first made in England during the latter part of 1878, about the same time that the foundation stone was being laid in Belgium of a hospital intended to be built upon this principle.

The design for this building, the Antwerp Civil Hospital, having received the approval of the Communal Administration of the town was referred to the consideration of the Council of Public Hygiene at Brussels, but this body strongly condemned the erection of circular wards upon grounds which, now the building is erected, would appear to have been correct. Nevertheless, the work was proceeded with, and the building is now opened, and may be inspected by those interested in the question.

No other Continental nation has, to my knowledge, considered this new system worthy of imitation, but in England many similar hospitals have been erected, and it is, I believe, in contemplation to erect others.

There is something very fascinating about the conception of a circular ward, and superficial consideration of the question would lead to a belief in the soundness of the arguments advanced in favor of the system; indeed, I was myself disposed, before critically examining the matter, to allow that this adoption might possibly be productive of some, if not all, the benefits promised by its advocates. This illusion was, however, dispelled when lately I had occasion to study the question in all its aspects for the purposes of a report to a public body prepared to erect this class of wards upon my recommendation, and I propose now to show the reasons that led me to the conclusion that parallelogram-shaped sick-wards are in every respect much more economical both in first cost and in management, and that no advantage is to be attained by the increased outlay consequent upon the erection of wards of circular shape.

My present remarks will be confined to a consideration of the erection of wards for general hospitals, and I do not propose in this paper to deal with the question in its application to fever or other wards for special cases. Nevertheless, I am equally convinced that the circular system as now advocated is wrong in any kind of hospital building, whatever be its special use or locality; but to deal with the question in its application to other than ordinary hospitals would involve considerations which the time at my disposal on this occasion will not allow of being entered into.

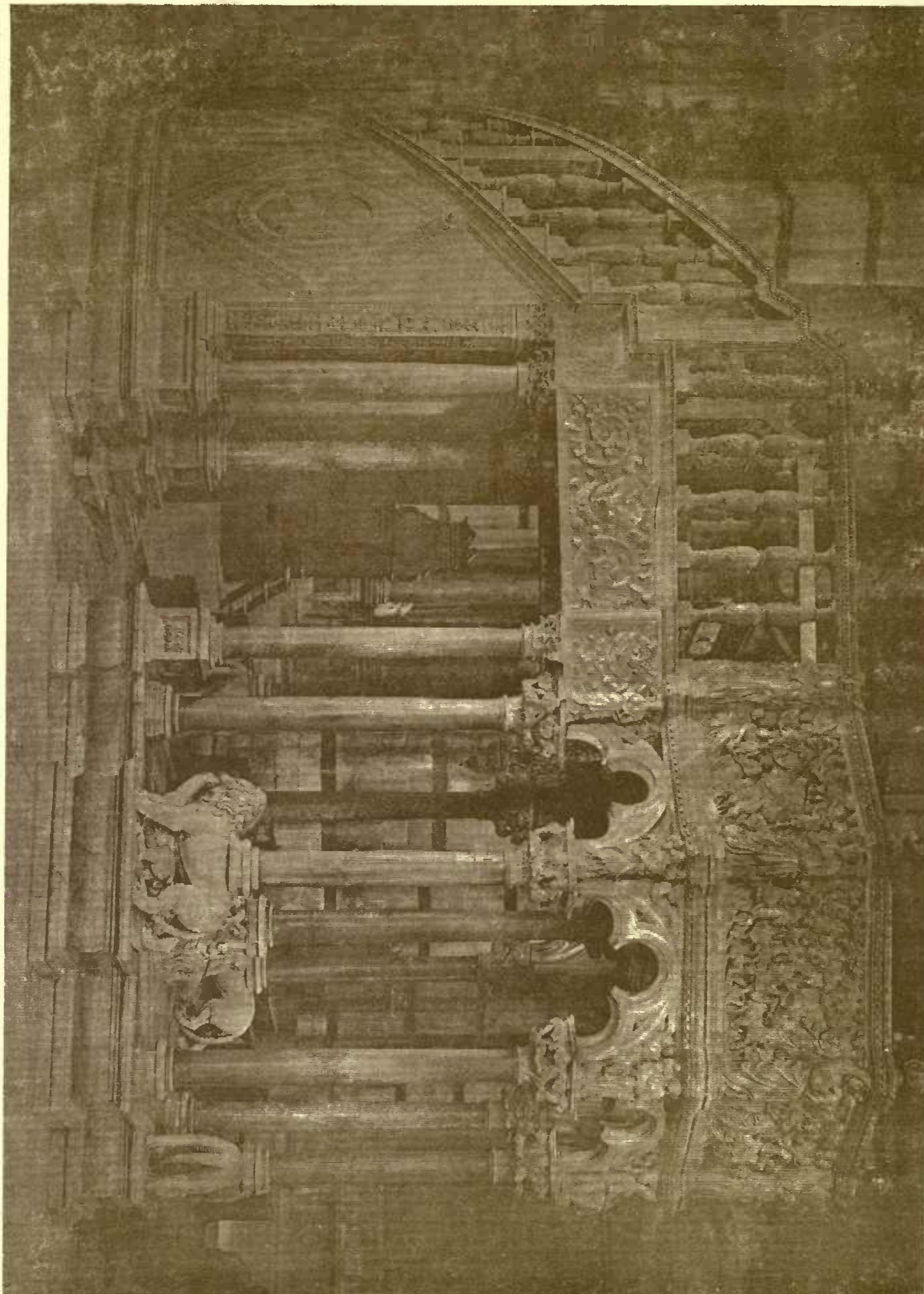
It will be well to consider what are the conditions necessary to be observed in the planning and construction of general hospital wards.

First as to the number of patients. I have the authority of Miss Nightingale, and of many hospital superintendents, for stating it to be essential that, besides the ordinary nurses and attendants, every ward should have the constant presence of one head-nurse in the day time and of one nurse at night time, and that those head and night nurses could each properly overlook forty patients as a maximum; but taking into consideration all the essentials for proper discipline and facility of administration, the number of patients in any one ward should not exceed thirty-two or be less than twenty; also, that in all cases one or at most two separation-wards, each for the accommodation of one or at most two patients, should be attached to the large ward, but not so as to communicate with it directly. All the wards should, however, adjoin the rooms occupied by the nurse having charge of the patients contained in them.

Except in the case of separation-wards, wards of small size are decidedly objectionable, because they are (says Miss Nightingale) "unfavorable to discipline, inasmuch as a small number, when placed together in the same ward more readily associate together for any breach of discipline than a larger number."[2] And it is also pointed out by her that one head-nurse, or one night-nurse, could not so efficiently superintend and overlook a number of small wards as one large one.

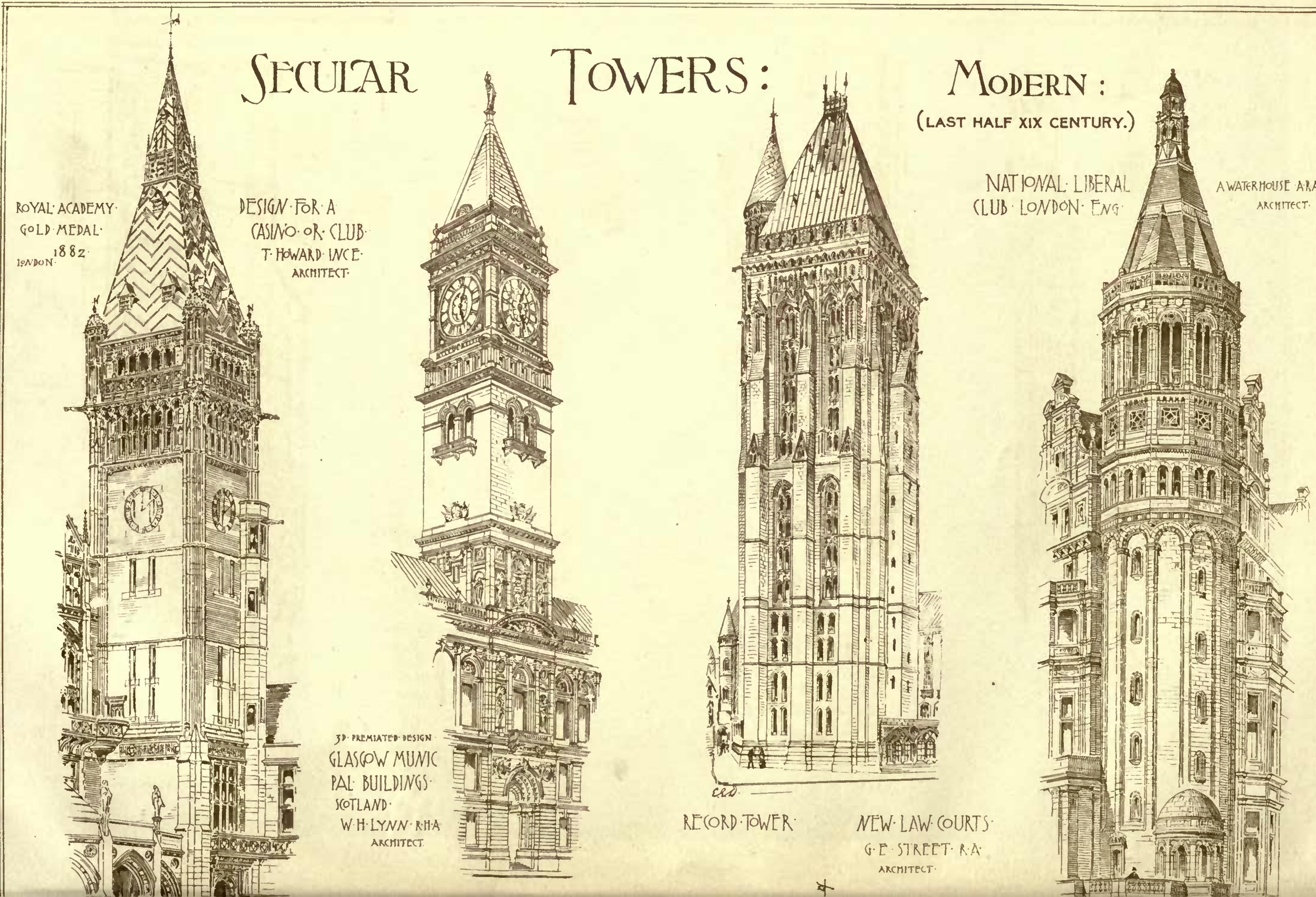
[1] A paper by Mr. H. Saxon Snell, F. R. I. B. A., read at the Congress of the Sanitary Institute of Great Britain, held at Leicester, and published in the *Builder*.

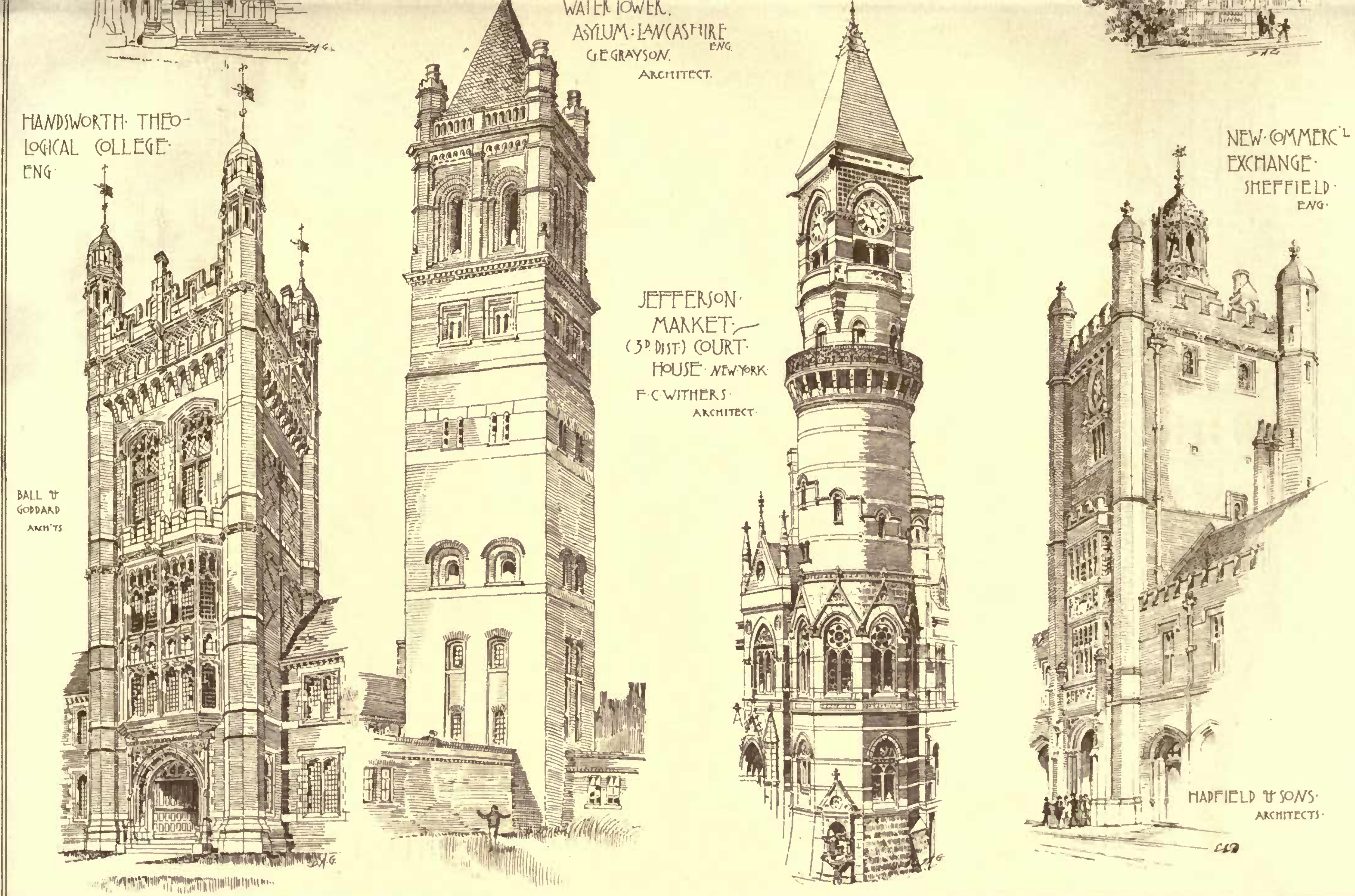
[2] "*Notes on Hospitals*," by Florence Nightingale, 1863.



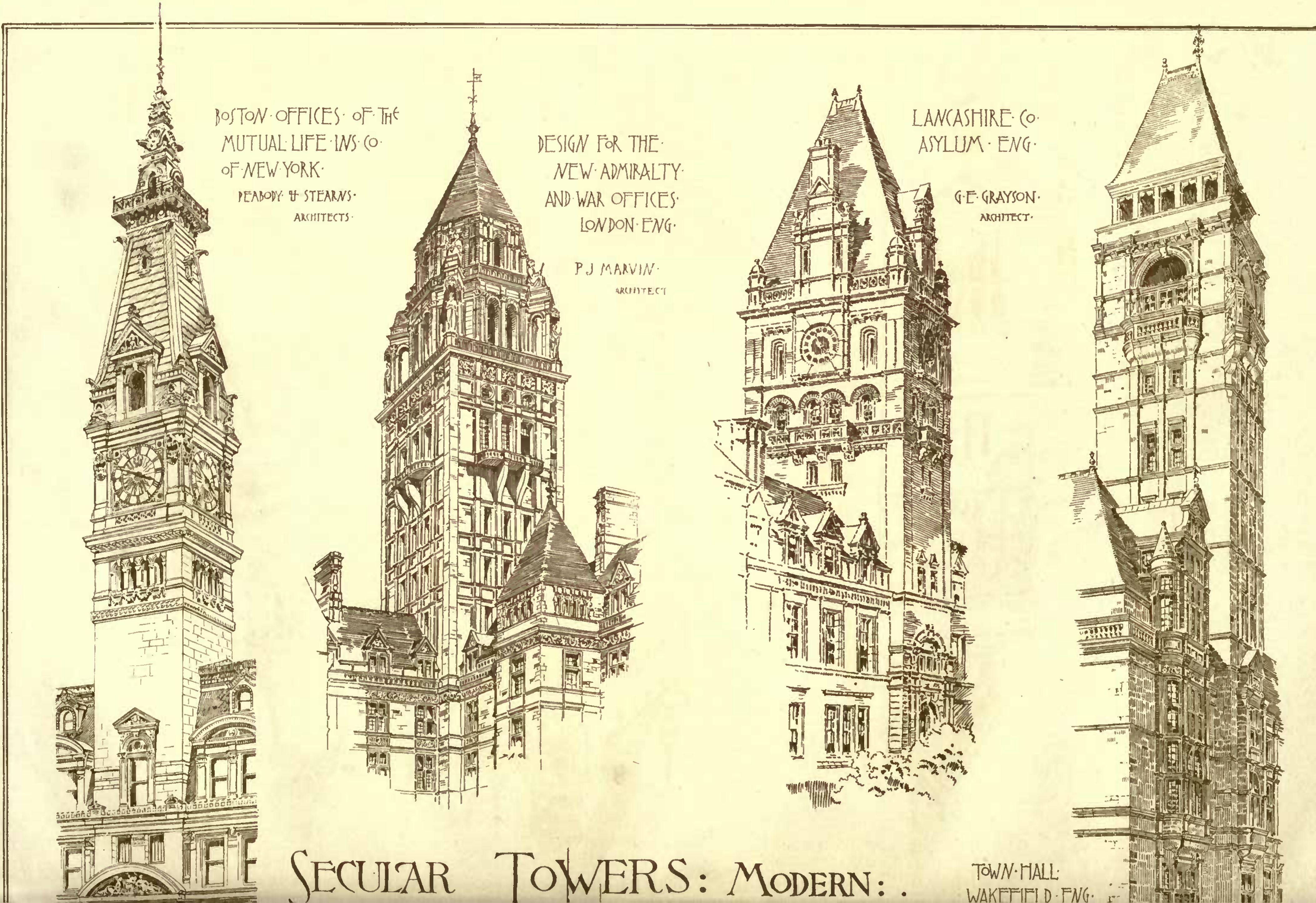
Pulpit in the Cathedral, Siena, Italy.

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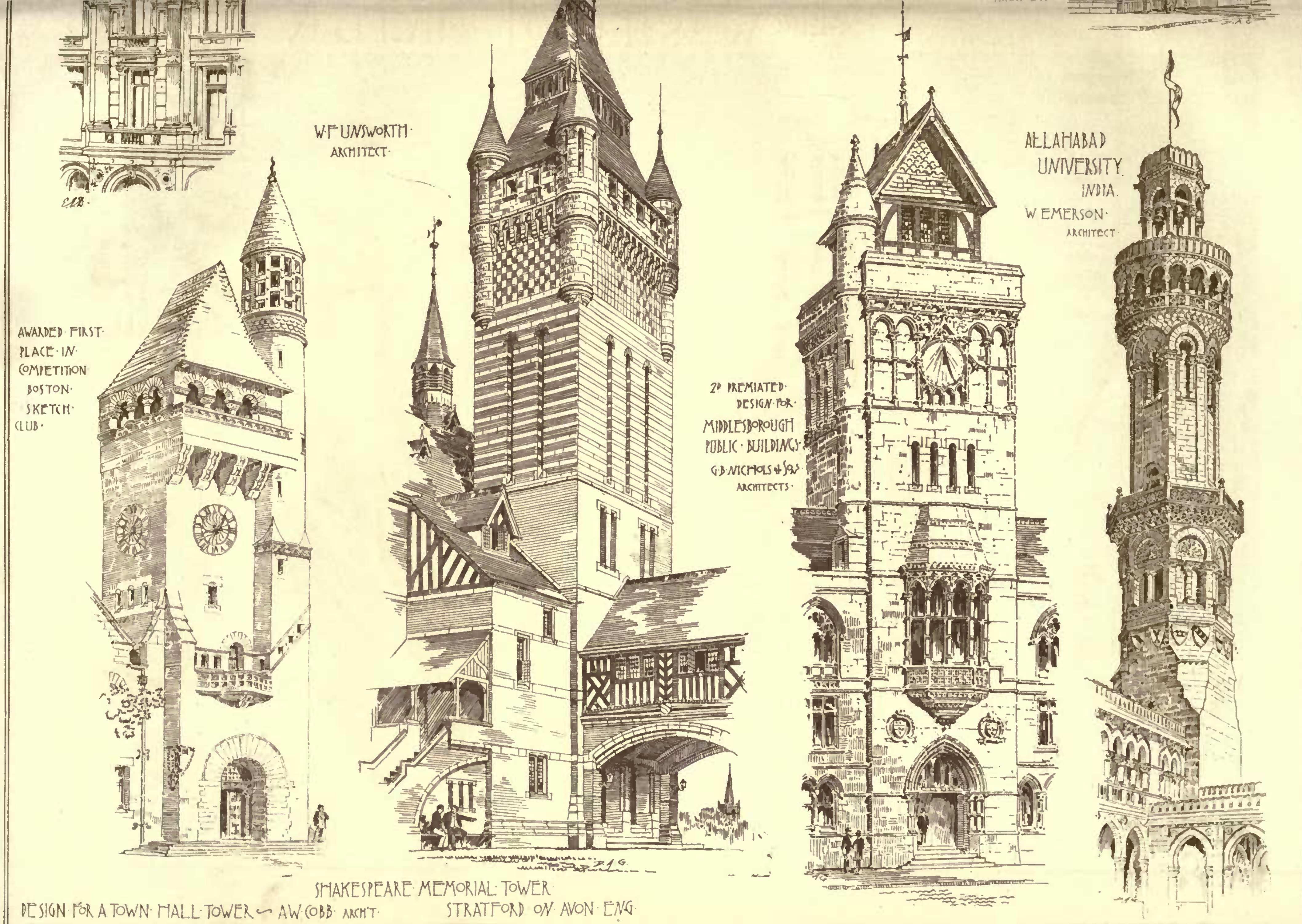

SECULAR TOWERS: MODERN:
(LAST HALF XIX CENTURY.)
ROYAL ACADEMY GOLD MEDAL 1882 LONDON
DESIGN FOR A CASINO OR CLUB T. HOWARD INCE ARCHITECT
3D PREMIATED DESIGN GLASGOW MUNICIPAL BUILDINGS SCOTLAND W. H. LYNN R.H.A. ARCHITECT
RECORD TOWER
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NATIONAL LIBERAL CLUB LONDON ENG
A. WATERHOUSE A.R.A. ARCHITECT



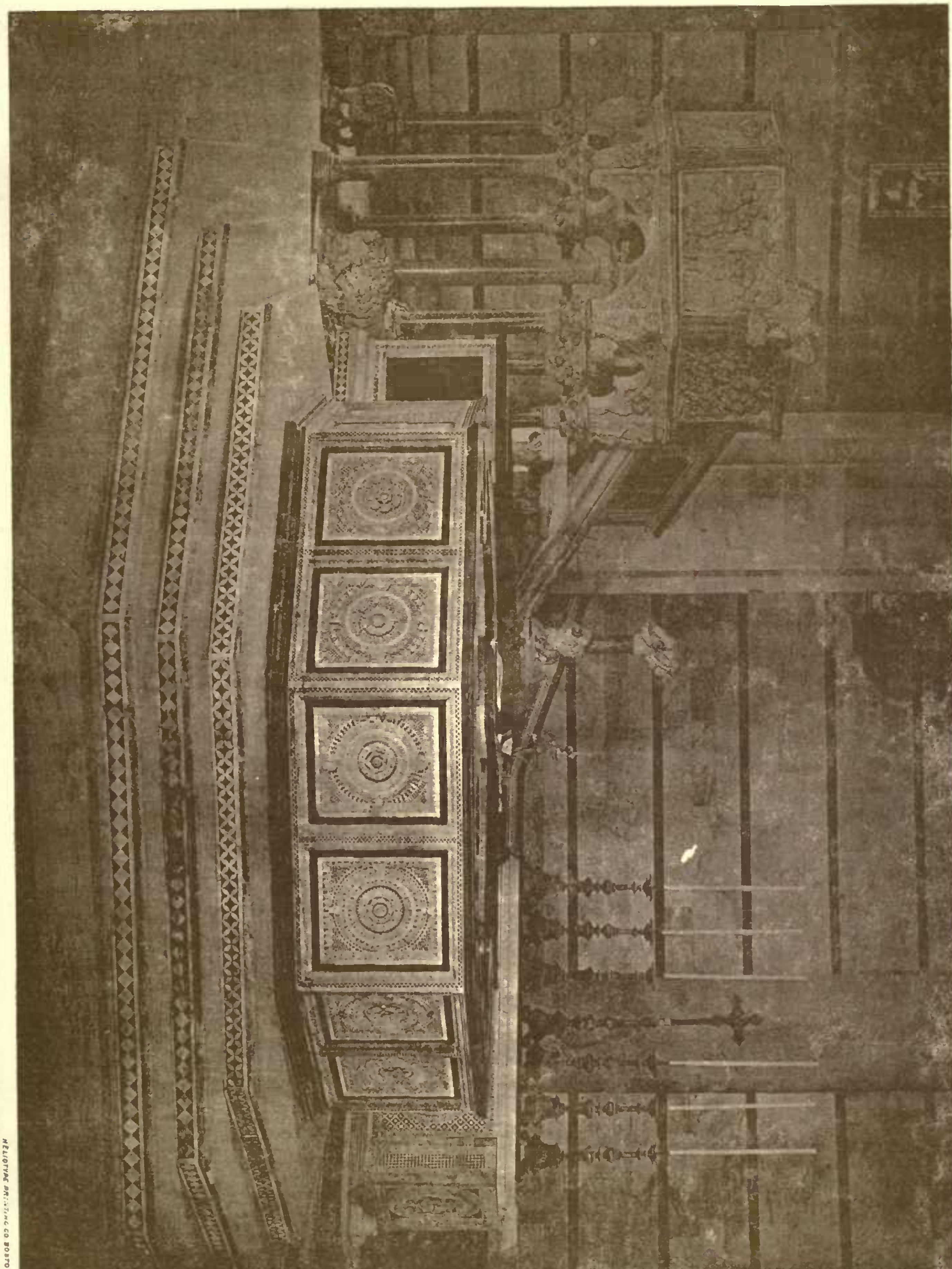
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SECULAR TOWERS: MODERN:.


W.F. UNSWORTH
ARCHITECT
AWARDED FIRST PLACE IN COMPETITION BOSTON SKETCH CLUB
2D PREMIATED DESIGN FOR MIDDLESBOROUGH PUBLIC BUILDINGS
G.B. NICHOLS & SONS ARCHITECTS
ALLAHABAD UNIVERSITY INDIA
W. EMERSON ARCHITECT
SHAKESPEARE MEMORIAL TOWER STRATFORD ON AVON ENG
DESIGN FOR A TOWN HALL TOWER — A.W. COBB ARCH'T
HELIOTYPE PRINTING CO. BOSTON

American Architect and Building News, Oct. 17 1885 No. 512



Each large sick-ward, whether it contains ten or thirty patients, must have attached to it at least two water-closets, and a slop-sink, separated by cross-ventilated lobbies. A bath-room should also adjoin each large ward. It is therefore clear that the fewer the patients in each ward the larger will be the total number of nurses required in the establishment, and the greater will be the multiplicity of nurses' rooms, water-closets, slop-sinks, bath-rooms, and other sanitary offices.

Suppose a hospital, to be designed for the reception of 576 patients, 540 of whom are to be placed in eighteen parallelogram-shaped wards containing thirty each, and the remaining thirty-six in smaller and adjoining separation-wards. If the buildings are three stories in height there would be six pavilions, but if, as I shall show, twenty-two patients only can be placed in the large wards because they are of circular shape, then eight pavilions would be required instead of six, and twenty-four wards instead of eighteen. In both cases these wards and pavilions are assumed to be of the same size.

It has been shown that the services of one head and one night nurse must be provided for each large ward, and it therefore follows that the adoption of this circular plan would involve the additional cost of twelve nurses for the six extra wards.

The two extra pavilions containing these six wards would also necessitate the additional services of one scrubber and one porter for carrying coals and meals, and attending the fires, furnaces, etc., and the salaries, uniforms, and maintenance of these fourteen additional officers cannot be put at less on the average than £50 a year each, or a total of £700.

The additional cost of fuel for the warming and hot-water supply to these two extra pavilions may be put at a minimum sum of £200 per annum, and the outlay for soap, soda, etc., for cleaning, and the periodical white-washing, painting and repair cannot be put at a less sum than £100 per annum. Therefore, the total additional establishment charges consequent upon the adoption of the circular system would be £1,000 as follows, viz., —

12 extra nurses 1 " scrubber 1 " porter	at £50 per annum each	£700 0 0
Extra fuel		200 0 0
Soap, soda, etc., and repairs		100 0 0
	Total	£1,000 0 0

This sum capitalized at three per cent (thirty-three years' purchase) would amount to £33,000, and this represents the additional cost of maintaining the 576 patients supposed to be housed in wards designed upon the circular system.

The additional cost per 1,000 patients would be £57,392, and this cannot be considered a large estimate, seeing that Miss Nightingale in her work on hospitals shows that where nine patients only are contained in a ward as against thirty-two patients in a ward, the additional capitalized outlay for nursing only, would be £196,775.

Now, as to the relative cost of erecting the buildings—a question involving primarily a consideration of the requisite sizes for the wards.

There must be much diversity of opinion amongst medical men and other authorities upon this point if we are to judge from the dimensions of recently-constructed hospitals.

Captain Douglas Galton considers that between 1,200 and 1,300 cubic feet of air-space per bed are all sufficient. Miss Florence Nightingale asks for from 1,200 feet to 1,500 feet. Dr. Parkes, speaking of hospitals generally, says that the space should be from 1,500 feet to 2,000 feet (the latter quantity referring, no doubt to fever, and the former to general hospitals). Dr. de Chaumont in his report upon the Norfolk and Norwich Hospital, shows upon mathematical bases, that where good ventilation exists no advantage is gained by making the air-space of large wards greater than 1,200 feet per patient.

The report of the committee appointed to consider the cubic space of metropolitan work-houses and infirmaries states that the cubic space to be allotted to ordinary sick patients in large wards "should not be less than 850 feet," but it is stipulated that no space above the height of twelve feet from the floor line shall be included in the calculation. This committee consisted of the following eminent authorities, viz.: — Drs. Thomas Watson (chairman), Henry W. Acland, Francis Sibson, W. O. Markham and John Randall, Captain Douglas Galton, Messrs. Uredale Corbett (Local Government Board Inspector), Timothy Holmes, F. R. C. S., and Charles Hawkins, F. R. C. S.

In my own practice, I have erected four large parish infirmaries, holding in the aggregate upwards of 2,500 ordinary sick patients, with less than 950 cubic feet of space to each, and the medical officers of these establishments have not found it necessary at any time to order the removal of any of the beds (as was contemplated), should one or more extraordinarily severe cases at any time be developed, and seem to call for increased space.

The Moabit Hospital at Berlin gives a space of only 864 cubic feet for each ordinary patient; but in this building one-fourth of the cases treated are stated to be of an acutely infectious character,[1] and we may presume that a larger space would be allotted for this class of patient. Yet the death-rate at this establishment, I am assured by eminent men who have examined the returns, is not above the average of other German hospitals.

The proper size of hospital-wards is not, however, to be determined by mere considerations of the greater or less quantity of air-space requisite for the well-being of a patient, for Dr. de Chaumont, in his report before referred to, has clearly shown that where, by good ventilation, a proper change of atmosphere is constantly effected, it matters not, within reasonable limits, what is the size of the ward. The question must be decided principally by consideration of floor-space, and here, again, examples and opinions are sadly diverse.

The Moabit Hospital, and the four parish infirmaries previously alluded to, contain about seventy superficial feet of floor-space per ordinary patient, and this is the quantity recommended by the before-mentioned committee of experts.

Captain Douglas Galton asks for from ninety feet to one hundred and twelve feet, Miss Nightingale from one hundred feet to one hundred and four feet, and Dr. Parkes and Dr. de Chaumont, from one hundred feet to one hundred and twenty feet. In each case these authorities seem to determine their maximum and minimum by the question of whether or no accommodation is to be provided around the bed for students, *i. e.*, whether the hospital is or is not to be designed for a medical school.

The disposition of the superficial space determined upon, whatever it may be, involves two important questions, viz., the width of the ward, and the distance apart of the beds. Twenty-four feet is conceded to be, for all purposes of administration, an all-sufficient width for any hospital ward, and, inasmuch as it is of the highest importance that each bed should have the largest possible space surrounding it, this width would, I apprehend, never be exceeded, were it not for the desirability of reducing the length of a ward to within a limit not exceeding one hundred and twenty feet.

In parish infirmaries the prescribed distance apart of the beds, *i.e.*, the bed-space, is six feet; but seven feet six inches or eight feet, is the width more generally adopted; and hence it comes about that the breadth of the wards is necessarily increased in some buildings to as much as thirty feet. And here I would point out that the advocates of the circular-ward system invariably and wrongly use the term "wall-space" as synonymous with "bed-space," or the distance apart from centre to centre of the beds, and they often improperly calculate this distance apart of the beds, by dividing the total length of the circumference of the circle by the number of beds, and so arrive at a deceptive result.

Take, for example, the description given in the *Builder*, of May 9th last, of "A projected Military Hospital," designed upon the circular system. It is there stated that the wards are each to be sixty-six feet internal diameter, and that they are to hold twenty-six patients: thus (says the description) "each patient will have a wall-space of eight feet."

As a matter of fact, if this military hospital is ever erected, and twenty-six patients crowded into its wards, each will have a lineal wall-space at the head of his bed of seven feet four inches, but the corresponding distance at the bottom of the beds will be but six feet three inches, that is to say, (the beds being three feet wide), the distance apart of them will be three feet three inches only; and, therefore, if it is required to know what really will be the space given per bed in this proposed hospital, as compared with the quadrangular plan of ward, we must calculate the average distances apart as given above the beds at the heads and at the feet, and then, instead of the delusive eight feet of wall-space, we shall find that the actual *bed-space* per patient in this proposed hospital would only be six feet nine-and-one-half inches.

The above results would be arrived at by deducting six feet six inches in width for each of the entrance lobbies, and then planning out the feet of the beds at an equal distance apart, and radiating them towards the centre of the circle.

Then, with regard to the height of hospital wards. It is only Professor Chaumont who expresses any decided opinion on this point, and the conclusion he arrives at, that twelve feet, or at most thirteen feet is all-sufficient, has since been confirmed by the results of experiments made by two eminent American physicians, Drs. Cowles and Wood[2] who proved to their satisfaction that no benefit arises from making wards higher than twelve feet. It is also, no doubt, upon these conclusions that the recommendations of the cubic-space committee before referred to were based.

Most other authorities regard the question of height as quite subsidiary to that of floor-space, as decided by considering the width of the ward, and the distance apart from centre to centre of the beds.

I have been particular in citing the opinions of these great authorities as to the requisite dimensions of ordinary wards, because I am about to show that it is practically impossible to design a circular hospital ward within the limits they have laid down without causing a useless multiplication of wards, ward officers, nurses and domestics, resulting in an enormous and wasteful outlay, first in the erection of the buildings, and for all time in the annual establishment charges; and my argument would therefore admit of contention if it could be shown that in the illustration I am about to give I exceeded these limits, for it will be seen hereafter that the smaller we take the units of space the greater will be the cost of the circular as compared with the parallelogram-shaped ward; and I therefore propose to take for illustration a ward of dimensions which shall approach as nearly as possible, the quantities asked for by the before-mentioned experts.

A parallelogram-shaped ward containing thirty beds, and being twenty-eight feet wide, one hundred and twenty feet long, and fourteen feet high, will contain 1,568 cubic feet, and one hundred and twelve feet of floor area per patient, whilst the bed-space will be eight lineal feet per patient.

[1] "*Hospital Construction and Management.*" London, 1883.

[2] Report of the State Board of Health of Massachusetts, 1879.

A circular ward of equal superficial floor space would be sixty-five feet six inches in diameter, and if it is required (as for proper comparison it must be) to keep the beds the same distance apart as in the parallelogram-shaped ward, this space would not contain so many even as twenty-two beds. For, if we consider the feet of the beds to be seven feet distant from the outer wall (six feet six inches for the length of a bed, and six inches space between it and the wall), and the width of the two lobbies as thirteen feet, we find that if there are twenty-two beds the lateral distance from centre to centre of the feet of each is six feet nine inches, and the corresponding distance between the heads eight feet eight inches, thus giving an average distance of seven feet eight inches only as against the eight feet space of the parallelogram-shaped ward. The result is that by the adoption of the circular plan we should have a ward containing less bed-space, and in round numbers respectively forty-one superficial, and 571 cubic feet per bed more than we started by admitting was necessary for the healthy condition of patients.

The waste space in the centre of a circular ward amounts respectively to 896 superficial and 12,553 cubic feet.

Various ingenious suggestions have been made for the disposal of part of this space. One proposes to erect a staircase which, according to his plan, would occupy 250 superficial feet out of the 895, and at the Antwerp Hospital, a still less quantity is enclosed to form a room (ostensibly, but never, I believe, in reality) for the use of a nurse. But besides the practical inutility of adopting these expedients, it will be seen that any such obstruction would only augment the difficulties of cross-ventilation already created by the necessity of having the windows between sixty feet and seventy feet apart.

What, then, is to be done with this superfluous space? It has to be built, to be kept clean, to be ventilated, to be heated; but, worst of all, it has to be paid for; and at what cost I will now consider.

The two additional pavilions previously shown to be necessary would cost, including heating, lifts and gas-fittings, £26,800, and the outlay for the additional accommodation of twelve nurses, including furniture and accessories, would amount to about £700, or together to £27,500. It will be observed that I have not taken into account the fact that the six remaining wards being built upon the circular system must of necessity be of more costly construction than if they were built upon the parallelogram principle.

The sum of £27,500 represents the additional cost of 576 beds, and is at the rate of £47,743 per 1,000 patients. Adding to this the capitalized cost of nursing these 1,000 patients, previously shown to amount to £57,392, we find that if the circular system is to come into vogue, we must be prepared for indulgence in the luxury (if it is one) at the rate of £105,135, for every 1,000 patients.

Should it suggest itself to any one to inquire how a circular would compare with a parallelogram-shaped ward if both were designed to contain thirty beds, an average distance of eight feet apart, it would be found that the circular ward must be eighty-seven feet nine inches in diameter, and consequently the waste or unnecessary space in the centre of it would amount to no less than 2,705 superficial feet. Moreover, it would be evident that the height of such a ward must be raised considerably if any sunlight at all is to approach the centre of it, and supposing this additional height to be, say three feet, the quantity of waste or unnecessary space in one ward alone would amount to 64,180 cubic feet. But this is not all, for it would follow that the adjoining offices, separation-wards, nurses' room, staircase, etc., must also be raised.

It will hardly be necessary, I think, to trouble you with the figures which would show the additional cost of this plan to be even greater than has been proved to result from a comparison of two wards of equal area, but with fewer beds in the one of circular shape. Neither need I point out to you how much all the other difficulties in regard to ventilation, lighting, heating, and want of cheerfulness would be enhanced.

Advocates of the system, however, say, "we have nothing to do with the cost; what we desire is to erect that description of building, whatever it may be, which best adapts itself to the cure of the patients to be contained in it;" and within reasonable limit this view of the question is no doubt a right one.

But I have searched in vain for any substantial arguments showing that from this point of view the circular is any improvement upon the parallelogram shape of ward, and I have little doubt that no such arguments could exist unless it can be shown that in contravention of Nature's laws air would as freely pass through a room from one side to another when the windows are sixty feet or seventy feet apart, as it would if those windows were from twenty-four feet to thirty feet apart. It would also have to be demonstrated that, in defiance of all mathematical rules, when the sun was shining, or the wind blowing against the straight wall of a parallelogram-shaped ward, less air and sun would penetrate through its window-openings than would penetrate an *equal* number of window-openings of the same size contained in the wall of a circular ward. And then, having proved this anomaly, it would be necessary to define the process by which as large a quantity of air and sun could be brought into the circular ward through its twenty-two windows as could be brought in through the thirty-four windows of the parallelogram-shaped ward.

This being made evident, the contention must be upheld that a ward having the distance of its parts from the windows varying from one foot to thirty-three feet, is as cheerful as one the parts of which vary similarly from one foot to fourteen feet only. And it must be shown that this cheerfulness will not be diminished by the height of the circular ward being one-fifth only of its diameter, as compared with the parallelogram-shaped ward, the height of which would be one-half its width.

But, supposing all these difficulties to be surmounted, it will only have been shown that, in the points referred to, the circular is as good as the parallelogram system, and then what is left to compensate for the £105,000 outlay before referred to?

It cannot be contended that, for the purposes of a medical school, where it is desirable the greatest space for students shall be given round and about the patient, the constriction of the feet of the beds, consequent upon their radiation towards the centre of the circle, is an advantage. It cannot surely be argued that it is a desirable arrangement to place a nurse (as at the Antwerp Hospital) in the centre of a sick ward, breathing all day its more or less foul atmosphere, rather than that she should be assigned an adjoining room, having a window through which she could overlook the patients. Neither can it be said that, if this central space is occupied by a staircase, such staircase would not be better placed (as in the parallelogram system) away from the ward and adjoining and giving direct access to the nurses' rooms, separation-wards, and other offices, and so avoiding the necessity of all persons and things passing through and disturbing the occupants of the large ward.

And if, then, these deviations from past practice cannot be shown to be improvements, what is left for those who would still be admirers of the new system to put forward as a claim for its superiority over the old one? I cannot say, neither can I imagine.

A STEEL STRONG-ROOM.



Cottage, Great Budworth, Ch. John Douglas Architect

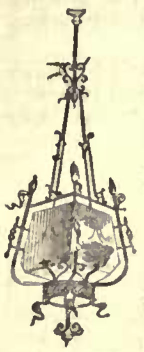
A STEEL strong-room, of very large dimensions, and having many important features, has just been constructed by Messrs. Chubb & Sons, at their works, Glengall Road, Old Kent Road. The strong-room is not only the heaviest, in proportion to its size, yet constructed here, but is believed to have the thickest walls of any steel room of such a size in use by British bankers. It has been made for a bank in Scotland, and exhibits several new and important improvements in detail. Having had an opportunity of inspecting the construction, we may describe the strong-room as one of unusual size, measuring about fifty feet in length, about fourteen feet in width, and of proportionate height, with three projecting porches or vestibules of steel on one side, between which the masonry of the wall will be built. Each of these doorways, which measures seven feet by three feet four inches, has a door seven inches thick, weighing about a ton and a half, hung on a hardened steel pin, on which it turns. The door is compounded of hard and mild steel plates, and is provided with Chubb's patent "diagonal bolts," which we have previously noticed in these pages, and which bolts, fitted to safes, gained the only gold medal at the International Exhibition. As examples of workmanship and finish these doors are unsurpassed. They are fitted with a central drop-handle of unique design, of gun-metal, by turning which twenty bolts are thrown out at opposite angles of forty-five degrees round the four edges of the door. These form a powerful wedge-resisting dovetail into each side of the frame, and make it impossible to introduce a wedge between them. Claws and clutches are not so resisting, and require larger bolt-holes, but these diagonal bolts are of rectangular section, and tend to bind together the door and frame. The twenty bolts weigh two hundred weight, and are so skilfully balanced that a child can throw them out or withdraw them when unlocked. Inside the door is a pair of folding grilles controlled by one key, with self-locking spring locks, which can be left locked in the daytime, allowing the outer solid doors to be thrown open for ventilation.

Entering one of the three compartments we find it fitted up with racks and cupboards, all of steel. The floor, like the walls, is of compound plates, in three thicknesses, and joined with extreme accuracy by machine-planed edges, and interlaced. In the central room there are man-holes introduced in the steel partitions for emergencies, by which communication may be established between the three rooms. The left-hand room contains a sort of *sanctum sanctorum* of security; it is divided by a partition at one end into two compartments fitted with separate doors and grilles, and contains treasuries and cupboards, all of steel. This reserve or "keep" of the fortress, if we may so term it, attains the acme of security, as various secret appliances are introduced to defeat the most insidious attempts of professional burglars. The walls are constructed of a triple series of plates, which give toughness and hardness, so that neither blows nor the cutting of drills has any effect. The "compounding" of the plates involved the drilling of no less than one thousand holes in each section, each hole being closed up and securing the plates in a manner to obviate weakness. This object is secured by the machinery employed by Messrs. Chubb. Absolute accuracy and matching

of all holes was obtained by marking every plate and bar from a template, the drilling being done with twist-drills under a powerful multiple machine. The internal steel partitions, four inches or five inches thick, contain cases of non-conducting composition, which would render a fire in one room incapable of spreading into the adjoining rooms.

The strong-room, we hear, occupied in construction seven months, and weighs nearly one hundred tons, and the immense number of drilled holes necessitated the machinery running night and day. When placed in its position the strong-room will be encased in massive walls of concrete, surrounded by a patrol passage, outside which is the thick stone outer wall of the building. We are informed this steel stronghold would be capable of holding one thousand two hundred and fifty tons' weight of gold bullion, equal in value to one hundred and ten million pounds sterling.—*Building News.*

AUSTRALIAN BIG TIMBER.



THE Australians are very modest over their trees, for they are credited with having some gigantic specimens in the immense forests with which their land is so abundantly covered, about which, were they minded, they could well boast. In the neighborhood of Melbourne some thirty years ago trees abounded by the side of which the biggest pines of Scandinavia would look mere poles. In the Black Forest through which the road, such as it was, to Forest Creek and Bendigo passed, skirting the foot of Mount Macedon, few of the iron and stringy bark and blue gum trees were less than 200 feet before the eye met with a branch. The average height of these forest giants would be equal to that of the Monument on Fish Street Hill, and it would be a long shot to bring down a possum, that the traveller might discharge his gun at, crouching on a branch of one of these giants. From recent accounts we learn that trees of exceptional size have been met with in Australia, and one is described in the pages of an American contemporary as being higher than any known tree in the States, not even excepting the giant Sequoias of California. This Australian monster of the gum species is stated to be 500 feet high, and was found in the Black Range of Berwick, in Victoria. More than twice the height of the Monument, 96 feet higher than the golden cross on the topmost pinnacle of St. Paul's Cathedral, means something that the mind cannot readily grasp. Any one crossing St. Paul's churchyard, and casting his eyes skywards at the glittering ornament crowning the vast dome of that venerable pile, will have some conception of what 500 feet high means, the cathedral ball and cross being some 400 feet above the gazer's head; hence the imagination can better conceive the lofty proportions these denizens of the woods attain. Most of the Australian trees are hard woods of great strength and closeness of grain and evergreens, shedding their bark, which comes off in long strips.

A peculiarity of the Australian forests is the number of fallen trees that the traveller meets with in his progress through the woods. It was rare to see one of these giants fall, but in the stillness of the night the resounding crash of trees falling, and subsequent reverberations as the trunks reached mother earth, startled the "new chum" who happened to be camping out on his way through the bush.

The night appeared to be the favorite time for these uprootings. The common notion was that the bush fires were the cause of the trees falling, but trees were frequently met with lying on the ground that presented no charred appearance. Another idea, and one which seems plausible, is that the immense weight and size of the trees overpower the sustaining fibres of the roots, so that they literally uproot themselves, and by their leverage topple over. This subject has not been fully treated in books on forestry, but it is one well worth studying. There seems nothing else to account for the constantly falling trees in the Australian woods.

It is an anomaly that with trees of monstrous growth, covering a third of the land, the colonists find it convenient to supply themselves from the forests of Europe, situated some 16,000 miles away, and adding £5 standard freight to the first cost, cheaper than using their own timber. It is not merely the difference between sawing hard and soft wood, however, that makes the latter so much more in demand. Steam overcomes that, but there are hundreds of things in favor of the easier worked wood. Nails are driven much more freely, holes bored, bits cut off, chiselled and jointed, and other hand work which has to be done that would be doubly laborious if native timber were used. The blessings of pine are best appreciated by those who have had to use both descriptions.

It is rather difficult to class Californian redwood (Sequoia) amongst the resinous trees, for the simple reason that there is no resin in it; but it certainly is not a whitewood, though having all the attributes of whitewood about it except color. It is a sort of nondescript tree with a special character of its own. Some of the trees are reckoned by botanists to be over 2,000 years old, while all of them are known to be of great antiquity, which is a questionable virtue in pines.

To what purposes sequoia wood will ultimately be applied the future alone can tell, but at its present price it is quite unsalable. At a cheaper rate it might circulate in the market, and a thousand uses be found for it. Its color and freedom from knots are its best recommendation, and for thin stuff, such as Venetian-blind laths, picture backs, mouldings, skirtings, matchlinings, and any inside joinerwork, it would answer capitally; for table tops its great widths would be serviceable, enabling kitchen and other tables to be made in one piece, as formerly, instead of out of two, or more, as is now mostly the case. But it must be put on the market at about the price of ordinary deals to make headway. — *Timber Trades Journal.*

VENTILATION OF SEWERS BY MEANS OF TALL CHIMNEY-SHAFTS.



Font: St Mary's Church.
Leicestershire Eng.

THIS means of ventilation has been used, according to Messrs Bancroft's book on "*Tall Chimney Construction*," where permission could be obtained from the owners of shafts, at

Bolton.	Hyde.
Burslem.	Newcastle.
Burton-on-Trent.	Rotherham.
Birkenhead.	Sunderland.
Blackburn.	Tynemouth.
Bolton-cum-Ilnacre.	Whitehaven.
Carlisle.	Widness.
Coventry.	Wolverhampton.
Halifax.	York.

Carlisle. — The Carlisle sewers, since their construction in 1855, have been ventilated by tall factory chimneys. This city was one of the first to take advantage of this help to sewer ventilation, and there are about thirty tall shafts connected with the sewers. Messrs. P. Dixon and Sons, of Shaddongate and West Tower Streets, were the first to allow the experiment to be made, on the understanding that if it was found to be injurious to the works the Carlisle authorities would cut off the connection; this, however, was not required to be done. The sewers in the neighborhood of their tall chimneys are well ventilated, the current of air passing through one of the ventilators connected to the Shaddongate shaft, 300 feet high, having a velocity of fifty miles per hour, the pressure of air at the base of the chimney being equal to a column of water one-and-three-tenths of an inch in height. From experiments made by Mr. H. U. McKie, city surveyor, Carlisle, it was found the sewers were perceptibly ventilated for a radius of 400 yards, equal to an area of 502,656 square yards, or over 103 acres, and if the system of sewers and house drains had been laid out and executed with a view of being ventilated by this shaft the surveyor had no doubt the radius could have been considerably extended.

Leicester. — 25 chimney-shafts have been connected to the sewers of this town, and the corporation are obtaining permission from manufacturers whenever they can to extend the system.

Sunderland. — 9 shafts are connected to the sewers here, and the surveyor says they are *not* a success.

Great Yarmouth. — 5 shafts, fifty feet high, have been specially built in connection with the main sewers to act as ventilators.

Coventry. — 15 shafts are here connected to the sewers of the town.

York. — 3 shafts are here utilized as ventilators.

Hereford. — 1 shaft only connected to sewers, and the effect is quite local; the few ventilators adjoining invariably act as *down* cast shafts, and the chimney as an *up* cast.

Blackburn. — In one case only is a chimney connected to aid the sewer ventilation.

Bolton.—A limited number of shafts have been utilized as sewer ventilators in this town, and with good results.

Mr. E. Buckham, Borough Surveyor, Ipswich, does not share in the fear that damage is likely to arise from explosions caused by gas leaking into the sewers, and thence travelling to the chimneys; he has not heard of such an accident, and thinks the possibility of it occurring most remote. The fact that sewers are only affected by these shafts to a limited extent is, in his opinion, rather in favor of their use than otherwise, because where the exhaust is too powerful there is a probability of the traps of the house-drains becoming unsealed.

FIRE-PROOF DOORS.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—To decide a dispute please tell me which door in your opinion would give best results as a protection against fire — the question of the comparative cost of the two not being taken into consideration — tinned door as described in Kidder's "*Architect's and Builder's Pocket-Book*," page 384, or a door made out of one-half inch iron strengthened by ½" x 4" iron strips riveted X ways on same.

SUBSCRIBER.

[A DOOR of half-inch iron strengthened as described would probably be more fire-proof than a tinned wooden door, especially if it were secured by bolts at top and bottom, so as to prevent the warping to which even so thick a mass of iron would be somewhat liable. It should be remembered, however, that no such doors are in use, except for the inner doors of the old-fashioned safes, and not often for these. A single 3' x 6½' door of half-inch iron with the bands mentioned, which, however, add very little to the resistance of the door to heat, would weigh with the hinges, about five hundred pounds. To hang such a door in the ordinary way would be impossible. In practice an iron door usually means nothing more than a

large iron shutter, of sheet-iron one-sixteenth or one-twenty-fourth of an inch thich, stiffened by bars one-eighth or one-quarter of an inch thick. A door like this is quickly warped out of shape by heat, allowing flames to enter the opening which it is supposed to protect, and a tinned wooden door is in such cases preferable.—Eds. American Architect.]

DISASTER TO A SHUTTER FACTORY.

To the Editors of the American Architect:—

Dear Sirs,—My factory for the manufacture of my Patent Rolling Blinds and Steel Shutters, at 527 and 529 West Twenty-second Street, was destroyed by fire on Sunday, September 27, and fearing that the intelligence of this catastrophe may deter intending purchasers from sending in their orders, I shall feel obliged if you will announce in your next issue that I have rented another factory-building at 550 and 552 West Twenty-fifth St., and have already recommenced work and shall proceed rapidly with the execution of all my old contracts, which I do not believe will be very greatly delayed. I am also fully prepared to receive any new orders, and to turn them out promptly. I am, dear sir,

Yours very respectfully, Jas. G. Wilson.

ARCHITECTS AND THE CUSTOMS LAWS.

Philadelphia, Pa., October 13, 1885.

To the Editors of the American Architect:—

Dear Sirs, — In *The Nation* for September 10, appeared a letter from Mr. Warren, an architect, describing how on landing at Boston some time since on his return from Europe, he was charged twenty-five per cent duty on certain books and photographs, which he intended to use in his profession. On appealing to the authorities at Washington, he states that the action of the officers at Boston was sustained. Now this is only one among the many instances which have occurred where custom-house officers for some reason or other have ruled that property of this kind was dutiable, even when honestly intended for professional use, and as such, coming under the law, exempting tools of trade, professional instruments, etc. My experience like that of many others, no doubt, was exactly the reverse of Mr. Warren's, under apparently similar circumstances. I brought with me through the New York Custom-House last June with very slight examination over $300 worth of books and photographs, besides a lot of sketches, on simply stating that I was an architect, and that these articles were intended for professional work. Before leaving London, I had on the advice of an American artist taken out a certificate from the Consul General as to the nature and value of the books and photographs and as to my citizenship and profession, but found no occasion to produce this paper at New York.

Architects as well as artists are going to Europe in larger numbers every year and generally returning with quantities of books, photographs and original work, and it behoves the profession as a whole to see that this uncertain and unequal administering of the law should be exposed and if possible corrected. If persons who have had experience of this sort would communicate with your valuable paper, a great deal of light might be thrown on the subject; and I am sure you could give information as to the true meaning and requirements of the law in the case, which would be very acceptable to those who intend going abroad to study or improve themselves in their profession. In view of the fact that the Annual Convention of the American Institute of Architects is about to meet, it would seem not inappropriate for a powerful body like it to take measures towards "straightening out things" between the profession and the Custom-House. The case is not a difficult one, nor the solution of the problem far to seek; but that there is a misunderstanding somewhere is evident. Very respectfully, Walter Cope.

NOTES AND CLIPPINGS.

Granulated Cork for Deafening. — Granulated cork, made by running scraps from a cork-factory through a mill till they are reduced to coarse powder is an excellent non-conductor of heat, and is very useful in construction of refrigerator-cars. Used on the floors of passenger cars it acts as a deadener of the noise of the running gear.

The Danger of making Excavations in New Orleans. — On the first of August excavations were begun in New Orleans for the reception of the gas-holders of the new Municipal Gas Company. The turning up of the earth was followed by sickness in the neighborhood, and the Board of Health caused an investigation of the matter. It was ascertained that two excavations were being made, each about one hundred and thirty-five feet in circumference, and about twenty-six feet deep. The contractor stated he had had about eighty men at work since August 3. Within a week after, one gang of forty men has experienced considerable sickness, thirty-four of the laborers having been taken sick with vomiting, purging and fever. Another force of about the same number had also experienced sickness, but not to the same extent. It was ascertained that years ago the accumulating excreta from slaughter-houses and cattle-yards was thrown into the batture at this point. The excavation, as far as it has extended, does not expose river sand, but dark, offensive matter. The Board of Health, regarding the making of excavations of any character in the midsummer months as a menace to the public health, applied to the courts for an order forbidding further digging until October 1, which order was granted on the 8th ult., and the work was stopped.—*Hydraulic and Sanitary Plumber.*

Balloon-Steering Experiments. — MM. Renard and Krebs, the aeronauts, whose experiments in balloon-steering aroused considerable interest some months ago, have not been idle since. They made a third and seemingly conclusive trial of their navigable balloon last Tuesday evening. The car contained three gentlemen, who, with the aid of the screw, were able to steer for given landmarks, to make head against the wind, and, after a number of evolutions in the air, return to descend at the starting-point. Yesterday evening these experiments were repeated, with equally satisfactory results, before the Minister of War and the chief of the engineers, who congratulated the persevering aeronauts on their success.—*London Daily News.*

Intermittent Stress on Girders. — Mr. Benjamin Baker, civil engineer, read a paper before the British Association, in the Section of Mechanics, which goes far to explain some otherwise unaccountable breakages of iron bridges, beams and girders. He showed, as the result of careful and long-continued experiment, that the power of an iron bar to bear weight is no test of its strength to endure weight in motion. It dislikes above all things intermittent weight. When five-minute trains are run over girders they can hardly be made strong enough, and even slow and frequent movement wears out the resisting power. The usual theory is that a bridge is safe if it can bear three times the heaviest weight ever placed upon it; but this is by no means the case if the weights move, and such a bridge would break down rapidly under the passing of twenty trains an hour. Many English bridges are unsafe, from this cause or from defective construction, and Mr. Baker added on the latter point a suggestion which would delight a Hindoo. American iron-founders, he said, adopted a type of bridge or other work and adhered to it, instead of trying all sorts, and it was found that from practice and observation of faults their bridges grew better and better. That is what the Hindoo workman has been saying for two thousand years or so, without getting much attention.—*Exchange.*

Magnetic Sand Mines. — The Magnetic Mining Company, with Henry Havemeyer as president and Henry R. Haines, Isaac W. Maclay and William E. Davies as trustees under the general law, has got possession of much land on Long Island on which are immensely valuable deposits of nearly pure iron. Haines in 1881 noticed large quantities of black sand on the beach, learned that its color was owing to the presence of 65 to 72 per cent of iron and began to buy up the strip of shore at low rates. The depression in iron made profitable working impossible for a time. Last year a novel process of converting ore into steel was invented, patented, and the Standard Vapor Fuel, Iron and Steel Company was formed on the patents. They experimented with the black sand, and found that they could make steel directly from it at a cost low enough to enable them even to export steel and make it pay. The steel was of the finest quality. A sample was taken to a manufacturer of surgical instruments and he said it was better than the steel he had been paying $2 a pound for. When the Magnetic Company heard of this they proposed to make a contract for furnishing ore sand to the Vapor Fuel Company. In the meantime they set about getting control of every patch of black sand along the coast. They paid up on their old leases to keep them going. The Vapor Fuel Company began to build works at Flushing Meanwhile the Vapor Company, to prevent the Magnetic Company from having a monopoly of the raw material, began buying scraps of the black beach, and the Magnetic people began experimenting with a view to converting the ore into steel without infringing the other concern's patents. Everybody is convinced that there is a mine of wealth in the black sand, and whichever wins will be getting iron or pure steel out of it before very long.

A New Statue found at Rome.—The bronze statue found lying in the bed of the Tiber on Saturday last has been successfully raised. This was a work of some difficulty, for it had evidently been flung into the river head foremost, and was found with the feet uppermost. The workmen first struck the metal plinth, which, being hollow, was supposed to be a large bronze plate. But on clearing the sand from below, the men quickly found the feet of the statue. It is a Bacchus, a little under life size, the head crowned with ivy leaves and berries. The left arm is flexed upward, the hand holding a long, vine-crowned thyrsus. The right hand hangs down and is extended a little outward. The face is very slightly turned to the right, and the weight of the body rests on the right leg, the left being bent at the knee, with only the ball of the foot and toes touching the ground behind. The statue is perfect in every respect, with the exception of a clean fracture above the right ankle, and that the thyrsus is broken into three pieces, which have all been found. It is a work of great beauty, but, as far as it is possible to form a judgment, coated as it still is in many parts with Tiber sand, I am inclined to attribute it to the Græco-Roman rather than to any Greek school of art. The face is strictly ideal, the line of the nose straight, and the mouth and chin are clearly and symmetrically modelled in full accordance with the typical rendering of the divus. The eyes are of some artificial material to imitate Nature, the iris being represented by globular concavities. Some are inclined to think the eyes are silver, but this cannot be ascertained until the incrustation of sand is removed, and that will not be a difficult task, for it is very loose. The bronze has a beautiful golden tint. The statue was found in the middle of the river, where the works are going on for sinking the foundations of the middle pier of the bridge which is to connect the new street through the Regola on one side and the Trastevere on the other, near the Church of San Crisogono. This spot is but a short distance from the northern extremity of the island of St. Bartholomew, and as a portion, extending more or less to where the works are proceeding, was washed away during one of the inundations in the Middle Ages, it is probable that the statue may have been flung into the river from the northern point of that island, where stood a temple of Faunus, mentioned by Ovid in the "*Fasti*":—

"Idibus agrestis fumant altaria Fauni
Hic ubi discretas insula rumpit aquas."

The recovery of three bronze statues within less than twelve months is something more than remarkable.—*London Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

327,514. WATER-PROOFING COMPOUND. — David Blackburn, Montreal, Quebec, Can.

327,559. WRENCH. — Albert Langstrom, Council Bluffs, Iowa.

327,563. WEATHER-STRIP.—Austin Lowe, Minneapolis, Kans.

327,566. ANVIL.—John Mackert, Springfield, O.

327,569. BRICK-MACHINE. — Gaylord Martin, Milwaukee, Wis.

327,597. WASTE-COCK FOR SINKS, ETC. — Samuel D. Samuels, Boston, Mass.

327,609. SAW-SET.—Wm. O. Smith, Boston, Mass.

327,6[illegible] COMBINED LOCK AND LATCH. —Lawrence Van A[illegible]e, Sharon, Conn.

327,6[illegible] SASH-CORD FASTENER.—Charles C. Webb, New York, N. Y.

327,638. PIPE-REAMER. — Matthew T. Wyatt, Quebec, Can.

327,641. COUNTERSINK. — Geo. W. Abbott and Geo. S. Forrest, Concord, N. H.

327,678. MANUFACTURE OF PAINT FROM METALLIC LEAD.—William E. Harris, New York, N. Y.

327,715. LOCK.—Archibald W. Paull and Daniel L. Heiskell, Wheeling, W. Va.

327,776. HANDLE FOR CROSSCUT-SAWS. — Christopher Eisenhardt, Philadelphia, Pa.

327,780. SCREW-DRIVER.—Noah Fellers, McComb, Ohio.

327,820. KNOB-ATTACHMENT.—Emery Parker, New Britain, Conn.

327,833. KNOB-LATCH. — William E. Sparks, New Haven, Conn.

327,842. FLOORING-MACHINE. — Judson T. West, Hope, Ark.

327,867. BRICK-MACHINE. — Louis Dernelle, Cheltenham, Mo.

327,874. PAINTING AND GRAINING TOOL.—Joseph Hammerl, Long Island City, N. Y.

327,876. AUTOMATIC FIRE-EXTINGUISHING APPARATUS.—Osborn B. Hall, Malden, Mass.

327,903–904. LUMBER-DRIER. — Gleason F. Starkweather, Pullman, Ill.

327,947. PAINT OR WHITEWASH BRUSH. — Thomas Huntbatch, Geneva, Iowa.

327,963. APPARATUS FOR AUTOMATICALLY CUTTING OFF GAS FROM BURNERS. — Charles G. Nye, Syracuse, N. Y.

327,973. BATH-TUB. — Francis J. Torrance, Allegheny, Pa.

327,976. FIRE-ESCAPE. — Theodore B. Woodward, Norway, Pa.

SUMMARY OF THE WEEK.

Baltimore.

DWELLINGS. — W. F. Weber, architect, is preparing plans for W. L. Stork, Esq., for 4 three-st'y and mansard marble-front buildings, to be erected on Mt. Royal Ave., commencing cor. Lenox St., to cost $22,000, and 3 three-st'y brick buildings, marble trimmings, on Lenox St.; cost, $10,500.

BUILDING PERMITS. — Since our last report thirty permits have been granted, the more important of which are the following: —

B. Hess, four-st'y brick building in rear s e cor. Fayette and Harrison Sts.

W. T. Phillips, 7 three-st'y brick buildings, w s Fulton Ave., n of Harlem Ave.

E. W. Gorman, 10 two-st'y and mansard brick buildings, n s Fairmount Ave., between Burke St. and Bradford Alley, and 4 two-st'y and mansard brick buildings, n s Fairmount Ave., between Patterson Park Ave. and Bradford Alley.

J. C. Parker & F. E. Yewell, 23 two-st'y brick buildings, w s Carey St., commencing s w cor. Baker St.

Poulton & Bro., three-st'y brick building, s e cor. Columbia Ave. and Scott St.

Shanbury & Dashield, 5 two-st'y brick buildings, commencing n e cor. Fort Ave. and Covington St.

C. Kraeter, three-st'y brick building, e s Central Ave., n of Orleans St.

C. L. & J. S. Clark, 8 two-st'y brick buildings, w s Ensor St., s of Preston St.

Edw. Roberts, 12 three-st'y brick buildings, s s North Ave., commencing s e cor. Ensor St.

S. D. Price, 12 three-st'y brick buildings, w s of Barclay St., commencing n w cor. Chase St.

C. E. Cronin, 3 three-st'y brick buildings, n s Hillen St., e of Front St.

G. A. Euler, three-st'y brick building, w s Little Paca St., between South Paca and Conway Sts.

J. F. Hawkins, 3 three-st'y brick buildings, w s Light St., s of Randall St.

Boston.

BUILDING PERMITS.—*Chestnut Ave.*, near Farrington St., dwell., 22′ x 28′; owner and builder, James O. Leary.

Falcon St., near Brooks St., dwell., 23′ x 30′; owner, Mrs. S. J. Low; builder, Chas. Low.

East Sixth St., Nos. 471 *and* 473, 2 dwells., 15′ x 29′; owner and builder, Jas. V. Devine.

Birch St., cor. Prospect St., dwell., 22′ and 27′ x 29′; owner, Catherine A. Hastings; builders, B. J. Mixon & Son.

Milton Ave., near Norfolk St., dwell., 16′ and 24′ x 31′; owner, M. A. Curtis; builder, C. A. Curtis.

Brooklyn.

BUILDING PERMITS. — *Adams St.*, w s, 132′ n Myrtle Ave., four-st'y brick tenement and office-building, gravel roof, wood and iron cornice; cost, $17,000; owner, Chas. D. Burwell, 53 South Oxford St.; architects, Eastman & Dans; builders, Th. Dobbin and Fisher & Holler.

Myrtle Ave., s s, 86′ w Grove St., three-st'y frame tenement, tin roof; cost, $4,000; owner, J. Darcy, New Jersey; architects and contractors, A. McKnight and G. Davis.

Fulton Ave., s s, 435′ w Buffalo Ave., two-st'y frame store and dwell., tin roof; cost, $3,500; owner, S. E. Leek, 642 Fifth Ave.

Willoughby Ave., No. 680, s s, 281′ e Throop Ave., three-st'y and basement brown-stone dwell., tin roof, iron cornice; cost, $10,000; owner, Herm. Reiner, 177 Stagg St.; architect, E. F. Gaylor; mason, T. Gibbons; contractor not selected.

First Pl., s s, 62′ 6″ e Henry St., 4 three-st'y and basement brown-stone dwells., tin roofs, wooden and brick cornices; cost, each, $5,500; owner, R. H. Laimbeer, 9 First Pl.; architect, G. L. Morse; builders, J. Ashfield & Son.

First Pl., s e cor. Henry St., 4 three-st'y and basement brown-stone dwells., gravel roofs, wooden and brick cornices; cost, each, $5,500; owner, Mrs. McV. Phillips, 251 Washington Ave.; architect, G. S. Morse.

Hamilton Ave., n w cor. Woodhull St., extends to Columbia St., four-st'y brick tenement, tin roof, wooden cornice; cost, $17,000; owner, Richard P. Charles, 66 East Fifty-fifth St., New York; architect, R. W. Buckley; builder, J. B. Jacobs.

Lexington Ave., No. 314, e of Nostrand Ave., four-st'y brick tenement, tin roof, wooden cornice; cost, $8,000; owner, Rebecca Dolbey, on premises; architect, A. Hill; builder, F. Weeks.

Montrose Ave., No. 43, n s, 50′ w Lorimer St., three-st'y frame (brick-filled) tenement, tin roof; cost, about $4,500.

Fourth Ave., n e cor. Thirty-seventh St., three-st'y frame store and dwell., tin roof; cost, $5,000; owner, S. Chestizzer, 449 Third St.; architect, G. W. Buse.

Fourth Ave., e s, 20′ n Thirty-seventh St., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, total, $5,000; owner and builder, same as last.

Henry St., e s, 100′ s First Pl., 3 three-st'y and basement brown-stone dwells., gravel roofs, brick cornices; cost, each, $4,500; owner, Mrs. M. V. Phillips, 251 Washington Ave.; architect, G. L. Morse.

Lorimer St., e s, 125′ s Nassau Ave., three-st'y frame tenement, gravel roof; cost, $4,400; owner, Mrs. Helen Egbert, 518½ Lorimer St.; architect, W. H. Fenwicke; builders, Smith & Gately and F. Egbert.

Marcy Ave., w s, extends from Middleton St. to Gwinnett St., 8 three-st'y frame (brick-filled) stores and tenements, and 5 tenements, tin roofs; cost, each, $4,500; owner and contractor, Jacob Bossert, 284 Rutledge St.; mason, J. Auer; architect, J. Platte.

Hull St., n s, 287′ 6″ w Saratoga Ave., 2 three-st'y brick store and tenements, tin roofs, wooden cornices; cost, each, $3,000; owner, Maria Baur; architect, E. Schrempf; mason, C. Baur; contractor, not selected.

Bedford Ave., Nos. 600 *and* 602, 23′ n w of Lexington Ave., 2 four-st'y brick stores and flats, gravel roofs, wooden and stone cornices; cost, $12,000; owner, H. F. Frederick, Myrtle Ave., cor. Skillman St.; architect, J. G. Glover; builder, M. Ryan; contractor, not selected.

Floyd St., No. 100, s s, 100′ e Marcy Ave., three-st'y frame tenement, tin roof; cost, $4,500; owner and builder, John Softy, 24 Thames St.; architect, R. von Lehn.

North Eighth St., No. 148, s s, 170′ e Third St., four-st'y frame tenement, tin roof; cost, $6,500; owner and builder, W. Smith, 323 Second St.; architect, W. Herbert.

Quincy St., n s, 190′ w Patchen Ave., 4 three-st'y brick and brown-stone dwells., tin roofs; cost, $15,500; owner, A. S. Walsh, Madison St., near Reid Ave.; builder, A. Miller.

Manhattan Ave., e s, 25′ n Java St., 2 four-st'y brick stores and tenements, tin roofs, iron cornices; cost, $20,000; owner, J. A. McCullum, exr., Adelphi St., near Park Ave.; architect, T. F. Houghton; builder, J. Rooney.

Hull St., n cor. Hopkinson Ave., three-st'y frame store and tenement, tin roof; cost, $4,500; owner, Daniel Lauer, 78 McDougal St.; architects and builders, Weeks & Lauer.

Wallabout St., No. 386, three-st'y frame (brick-filled) tenement, tin roof; cost, $4,500; owners, Abmeyer & Peters, 19 Moore St.; architect, H. Vollweiler; builders, Mr. Hoepher and J. Auer.

Jefferson St., Nos. 190 *and* 192, s s, e of Bushwick Ave., 2 three-st'y frame (brick-filled) stores and dwells., tin roofs; cost, $8,000; owner and builder, Stephen Burkbard, 82 Central Ave.; architect, H. Vollweiler.

Broadway, e s, about 80′ s Lafayette Ave., three-st'y frame (brick-filled) dwell., tin roof; cost, $7,000; owner, James P. Little, 1041 Broadway; architect, P. M. Smith; builder, E. Kramm.

Van Brunt St., w s, 100′ s President St., two-st'y and basement brick dwell., tin roof, wooden cornice; cost, $4,300; owner, Norwegian M. E. Church, on premises; architect, Mr. Bogert; builders, M. Gibbons & Son and J. H. French.

Broadway, e s, 25′ n Lafayette Pl., three-st'y brick store and dwell., tin roof, wooden and iron cornice; cost, $8,000; owner and builder, M. Fardon, 1136 Lafayette Ave.; architect, H. Vollweiler.

Sixth Ave., s e cor. Tenth St., 5 three-st'y brick stores and dwells., tin roofs, wooden cornices; cost, each, $5,000; owner and builder, John Connor, Sixth Ave., cor. Tenth St.; architect, C. B. Sheldon.

New York Ave., e s, 57′ 6″ s Prospect Pl., three-st'y brick and brown-stone dwell., slate roof, iron cornice; cost, $17,000; owner, John Simmons, Bedford Ave., cor. Atlantic Ave.; architects, G. F. Chappell & Co.; builders, C. King and M. C. Rush.

Marcy Ave., s w cor. Jefferson St., one-st'y brick chapel, slate roof, wooden and iron cornice; cost, $9,000; owner, Trinity Presbyterian Church, 168 Hancock St.; architect, A. Howe, Jr.; builders, G. Philips and P. T. O'Brien.

Lynch St., s s, 80′ w Marcy Ave., 4 three-st'y frame (brick-filled) tenements, tin roofs; cost, $4,500; owner, Marg. Mulvihill, 115 Lynch St.; architect, J. Platte; builder, N. Mulvihill.

Howard Ave., s w cor. Madison St., three-st'y frame store and dwell.; owner, Rademacher, 55 Ralph Ave.; architect, F. Holmberg.

Butler St., s s, 142′ w Rogers Ave., two-st'y brick dwell., tin roof; cost, $3,500; owner, E. H. Hawkins, 716 Gates Ave.; architects and builders, Wm. & E. H. Hawkins.

Bergen St., Nos. 305 *and* 307, n s, 70′ e Third Ave., one-st'y brick warehouse, gravel roof; cost, $3,500; owner, Long Island Brewery, 81 Third Ave.; architect, M. J. Morrill.

Halsey St., s s, 325′ w Lewis Ave., 3 three-st'y brick dwells., tin roofs; total cost, $30,000; owner, E. Taylor, 231 West One Hundred and Twenty-second St., New York; architect, R. Rosenstock.

Fifth Ave., s w cor. Douglass St., 5 four-st'y brown-stone stores and tenements, gravel roofs; cost, each, about $4,000; owner, Geo. R. Brown, 34 South Portland Ave.; builders, L. E. Brown and J. F. Kentana.

Putnam Ave., s s, 215′ e Tompkins Ave., three-st'y brown-stone dwells., tin roofs; cost, $7,000; owner, architect and builder, Chas. Isbill, 440 Putnam Ave.

Ryerson St., w s, 250′ s Flushing Ave., four-st'y brick factory, tin roof; cost, $14,000; owner, John Gray, 272 Ryerson St.; architects, John V. Hanlon and C. Collins.

North Sixth St., No. 214, s s, 140′ e Fifth St., four-st'y frame (brick-filled) tenement, tin roof; cost, $6,000; owner, Wm. H. Connor, North Sixth St., cor. Fifth St.; architect, A. Herbert; builder, J. Fallon.

North Fifth St., No. 248, s s, 75′ w Seventh St., four-st'y frame (brick-filled) tenement, tin roof; cost, $5,600; owner and builder, Henry Hussennetter, 251 North Second St.

Ninth Ave., s cor. Eighteenth St., 7 three-st'y brick tenements, gravel roofs; total cost, $38,500; owners and architects, J. H. Doherty & Bro., 286 Flatbush Ave.

Verona St., n e cor. Richard St., 2 two-st'y and three-st'y brick factories, iron and wood roofs; cost, $60,000; owner, Chesebrough M'f'g Co., Richard and Delavan Sts.; architect, E. G. Brown.

Palmetto St., n s, 175′ from Hamburg St., three-st'y frame (brick-filled) dwell., tin roof; cost, $4,500; owner, John Clark, 219 Hudson Ave.; builders, R. Flynn and B. McEntee.

Melrose St., Nos. 156 *and* 158, s s, 150′ w Knickerbocker Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,000; owners, Daniel Kreuder and M. Mayer, 47 McKibben St. and 342 Ellery St.; architect, Th. Engelhardt; builders, D. Kreuder and M. Mayer.

Garden St., Nos. 58–66, s s, 14′ 6″ w Bushwick Ave., five-st'y brick ale brewery, gravel roof, brick and stone cornice; cost, $15,000; owner, Claus Lipsias, Bushwick Ave., cor. Forrest St.; architect, Th. Engelhardt; builders, J. Rauth and J. Rueger.

Belvidere St., Nos. 31–35, n s, 50′ w Beaver St., two and three st'y brick machine and boiler house, gravel roof; cost, $15,000; owner, William Ulmer, Beaver St., cor. Belvidere St.; architect, Th. Engelhardt; builder, S. J. Burrows.

Stone Ave., w s, 80′ n Somers St., 2 three-st'y brick tenements, gravel roofs, wooden cornices; cost, each, $4,000; owner, Henry C. Baker, 1108 Fulton St.; architect, A. Hill; builder, S. C. Prescott.

Park Ave., s s, 205′ w Marcy Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,500; owner and builder, George Straub, Lewis Ave.; architect, Th. Engelhardt.

Belvidere St., Nos. 27 *and* 29, n s, 35′ 6″ w Beaver St., two-st'y brick office, tin roof, terra-cotta cornice; cost, $4,000; owner, Wm. Ulmer, on premises; architect, Th. Engelhardt; mason, S. J. Burrows.

Boerum St., No. 256, s s, 524′ e Bushwick Ave., three-st'y frame (brick-filled store and tenement, tin roof; cost, $4,500; owner and builder, N. Dannenhoffer, Throop Ave., cor. Gerry St.; architect, Th. Engelhardt.

Sixth St., s s, 245′ w Seventh Ave., 6 three-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $6,500; builder, C. B. Sheldon.

Sixth Ave., e s, 50′ s Seventh St., 2 two-st'y and basement brick dwells., tin roofs; cost, each, $3,500; owner and contractor, Thomas Butler, 371 Sixth St.; architect, W. H. Wirth.

Ninth Ave., e s, 100′ n Eighth St., three-st'y brick store and dwell., tin roof; cost, $5,000; owner, builder and architect, same as last.

Broadway, Nos. 752–762, and *Nos.* 2 *and* 4 *Stuyvesant Ave.*, 3 four-st'y brick stores and dwells., tin roofs; cost, total, $32,000; owner, A. Vigelius, 10 Stuyvesant Ave.; architect, Th. Engelhardt; builders, U. Maurer and J. Frisse.

Clinton Ave., w s, 288′ n Greene Ave., four-st'y brown-stone dwell., tin roof, also extension; cost, $18,000; owner, Wm. A. Husted, 130 St. James Pl.; architect, J. G. Glover; builder, A. Rutan; contractor, not selected.

Eighth Ave., No. 31, e s, 50′ n Berkeley Pl., three-st'y and basement brick dwell., tin roof; cost, $13,000; owners and architects, J. H. Doherty & Bro., 286 Flatbush Ave.

Hancock St., s s, 100′ from Nostrand Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, each, $6,000; owner and builder, S. E. C. Russell, Hancock St., near Bedford Ave.; architect, I. D. Reynolds.

Halsey St., s s, 375′ e Sumner Ave., 2 two-st'y brick dwells., tin roofs; cost, each, $3,000; owner, Nellie M. McLain, 292 Macon St.; architect and carpenter, J. I. McLain; mason, J. Brown.

Ralph Ave., n e cor. Pacific St., one and two st'y frame car-house and stable, gravel roof; cost, $20,000; owner, Broadway Railroad Co., 21 Broadway,

E. D.; architect, G. W. Anderson; builders, P. Brady and J. D. Anderson.

Alterations.—*Pierrepont St., No.* 58, mansard roof, interior alterations, new stone-work, and also one-st'y and basement brick extension, tin roof; cost, $6,000; owner, Wm. Zeigler, Mansion House; architects, Parfitt Bros.

Schenck St., w s, 130' n Park Ave., four-st'y frame extension; cost, $2,500; owner, M. F. McDermott, 479 Willoughby Ave.; architect, P. H. Kilgeon; builder, M. Myers.

Beaver St., Nos. 63-73, one-st'y brick extension, interior alteration, ice-chamber, iron beams, columns, etc.; cost, $12,000; owner, William Ulmer, Beaver St., cor. Belvidere St.; architect, Th. Engelhardt; builder, S. J. Burrows.

Chicago.

Store.—Three-st'y block of stores and flats for Patterson Bros., to be built cor. Cottage Grove and Forty-third St. Anderson pressed-brick with red terra-cotta, and a large amount of fine stained-glass; cost, $45,000; contracts let; McAfee & Lively, architects.

Flat.—Also a double flat for same owners, 215 West Thirty-sixth St, inclosed; cost, $25,000; McAfee & Lively, architects.

A flat building for Henry Bentz, 352 West Congress St.; cost, $5,000; architects, same as last.

Flat and store building for B. Quigley, 444 West Twelfth St.; cost, $4,800; architects, same as last.

Houses. — Two dwells. for W. Lister, 261 Park Ave., to cost, $8,000; architects, same as last.

Building Permits. — F. Bartolmei, two-st'y store and dwell., 305-307 Ogden Ave.; cost, $5,000.

C. Kaufman, three-st'y store and flats, 3207 Archer Ave.; cost, $6,000.

R. Born, two-st'y dwell., 767 Washington Boulevard; cost, $6,000.

M. Hinsel, two-st'y store and dwell., 254 Dayton St.; cost, $4,500.

Mrs. B. Titus, 6 two-st'y dwells., 1035-1045 West Van Buren St.; cost, $18,000.

Proctor & Wood, 4 two-st'y dwells., 3221-3225 Rhodes Ave.; cost, $8,000.

W. J. Evans, two-st'y dwell., 1146 Monroe St.; cost, $3,500.

E. Graham, three-st'y store and dwell., 466 West Van Buren St.; cost, $5,000.

Mrs. E. Cotton, three-st'y store and dwell., 3004 State St.; cost, $10,000.

Silver Bros., three-st'y store and dwell., 3002 State St.; cost, $10,000.

H. & H. Dense, 2 two-st'y flats, 882-886 Thirty-second St.; cost, $2,500.

J. Osgood, two-st'y dwell., 274 Irving St.; cost, $3,500; architect, W. L. Carroll.

Mrs. M. Keppes, 2 two-st'y dwells., 310 Park Ave.; cost, $6,000; architect, T. Karls.

H. Giroux, two-st'y dwell., 34 Spruce St.; cost, $2,600.

A. Moody, two-st'y dwell., 777 Washington Boulevard; cost, $10,000.

J. G. Nelson, 6 two-st'y dwells., 693-703 West Erie St.; cost, $13,000.

J. M. Carroll, three-st'y store and dwell., 471 Milwaukee Ave.; cost, $9,000.

J. Plaeck, 2 two-st'y dwells., 423-425 Twenty-fifth St.; cost, $6,000.

M. Rainburg, two-st'y flats, Centre Ave.; cost, $10,000.

J. Pahrens, two-st'y dwell., 3218 Vernon Ave.; cost, $7,000.

M. E. Swart, 2 three-st'y stores and dwells., 2800-2802 Wentworth Ave.; cost, $11,000.

E. Bloedern, two-st'y dwell., 316 North Wood St.; cost, $2,800.

J. McCaffery, 4 three-st'y flats, 164-168 Sebor St.; cost, $12,000.

S. A. Cunningham, 4 three-st'y dwells.; 410-416 East Chicago Ave.; cost, $20,000.

C. P. Dose, two-st'y dwell., 232 West Division St.; cost, $10,000.

W. Styrl, two-st'y dwell., 3200 Fifth Ave.; cost, $8,000.

Mrs. D. Dobbin, two-st'y dwell., 821 Warren Ave.; cost, $3,000.

R. C. Rounsavell, two-st'y flats, 285-287 Webster Ave.; cost, $9,000.

M. Hanley, two-st'y flats, 223 Loomis St.; cost, $3,500.

Mrs. M. T. O'Hara, two-st'y dwell., 128 Sangamon St.; cost, $3,000.

C. Swigart, three-st'y store and flats, 957-959 West Madison St.; cost, $12,000; architect, C. N. Weare.

E. Johnson, four-st'y store and flat, 115 West Huron St.; cost, $10,000.

C. Breyer, two-st'y flats, 576 North Robey St.; cost, $3,800.

W. H. Fleming, two-st'y flats, 3647-3649 Forest Ave.; cost, $8,000.

Mrs. B. Titus, 3 three-st'y dwells., 114-118 Thirty-third St.; cost, $10,000.

J. E. Koehsel, four-st'y store and flat, 328 Indiana St.; cost, $7,500.

W. A. Loveland, 2 two-st'y dwells., 3648-3650 Prairie Ave.; cost, $6,500.

F. Schultz, two-st'y flats; cost, $3,500.

M. Myers, two-st'y flats, 912-914 Ashland Ave.; cost, $8,000; architect, H. R. Wilson.

J. Weils, two-st'y dwell., 179 Sedgwick St.; cost, 5,000.

Ernst Bros. Brewing Co., three-st'y office, 67 Larrabee St.; cost, $8,000.

Ernst Bros. Brewing Co., two-st'y barn, 51 Larrabee St.; cost, $8,000.

T. Hill, 6 two-st'y dwells., 835-845 West Congress St.; cost, $14,000.

O. Tremain, two-st'y flats, 325-337 Loomis St.; cost, $5,000.

F. Harvey, two-st'y dwell., 3112 Vernon Ave.; cost, $4,500.

H. A. Osborn, three-st'y store and flats, 494 West Madison St.; cost, $12,000.

M. H. Lukin, two-st'y dwell., 587 North Ave.; cost, $4,500.

J. Hickson, 2 two-st'y dwells., 628-630 Hulbut St.; cost, $10,000; architect, O. G. Pieser.

Minneapolis, Minn.

Building Permits.—Frank Zerbaugh, two-st'y wood dwell., s s Redegund Ave., bet. Lindley and Lyndal Aves.; cost, $3,000.

P. G. Lameraux, two-st'y wood dwell., n e s First Ave., bet. East Thirty-first and East Thirty-second Sts.; cost, $8,000.

P. G. Lameraux, two-st'y wood dwell., w s First Ave., bet. East Thirty-second and East Thirty-third Sts.; cost, $8,000.

C. D. Haven, two-st'y wood dwell., s w s Fourth St., bet. Eleventh and Twelfth Aves., s; cost, $3,000.

Geo. H. Leeth, two-st'y wood dwell., w cor. North Irving and Fifth Aves., n; cost, $3,000.

Frank G. Ball, two-st'y wood dwell., n e s Clinton Ave., bet. East Twenty-fifth and East Twenty-sixth Sts.; cost, $3,000.

Minneapolis Gas-Light Co., brick purifying house, e s Cedar Ave., bet. Bluff and River Sts.; cost, $10,000.

Hugh Harrison, two-st'y wood dwell., s s Oak Grove St., near Vine Pl., s; cost, $3,000.

Randolph Mitchell, two-st'y wood dwell., w s Lyndale Ave., bet. Linden and Hawthorne Aves., n; cost, $5,000.

Albee Smith, two-st'y brick dwell., n s West Fifteenth St., bet. Vine and Spruce Aves.; cost, $6,000.

Jeremiah Spear, 4 three-and-a-half-st'y brick veneer dwells., e s Tenth Ave., bet. Second and Third Sts., s; cost, $20,000.

Jeremiah Spear, two-st'y brick veneer barn, e s Tenth Ave., bet. Second and Third Sts., s; cost, $2,000.

J. H. Collom, 3 three-st'y brick tenements, s e cor. North Lyndale and Seventeenth Aves., n; cost, $12,500.

J. H. Collom, 2 two-st'y brick stores, s e cor. North Lyndale and Seventeenth Aves., n; cost, $7,500.

Congregational Church Society, brick veneer church, w s Fourteenth Ave., bet. Talmage and Como Aves., s; cost, $10,000.

Minneapolis Mill Co., wood and iron gate-house, Canal St., at foot of Sixth Ave., s; cost, $4,200.

R. E. Ledgerwood, four-st'y brick store, n e s Washington Ave., bet. Thirteenth and Fourteenth Aves., s; cost, $6,000.

Jno. S. Homan, two-st'y wood dwell., e s Seven-and-a-half Ave., bet. East Nineteenth and East Twentieth Sts.; cost, $4,000.

Frank E. Crew, two-st'y wood dwell., s w s Park Ave., bet. East Nineteenth and East Twentieth Sts.; cost, $3,000.

E. J. Phelps, 7 three-st'y brick tenements, e s Nicollet Ave., bet. East Sixteenth and East Seventeenth Sts.; cost, $30,000.

City of Minneapolis, two-st'y brick engine-house addition, s w s Prairie St., bet. Central and First Aves., s; cost, $8,000.

New York.

Building Permits. — *Eighty-seventh St.*, s s, 4 five-st'y brick tenements, flat tin roof; cost, $80,000; owners, Moore & McLaughlin, 240 East Seventy-first St.; architects, Thom & Wilson, 1267 Broadway.

East Eighty-fifth St., No. 109, five-st'y brick tenement, brown-stone front, flat tin roof; cost, $20,000; owner, Joseph Murray, 1472 Fourth Ave.; architects, Babcock & McAvoy, 64 College Pl.

One Hundred and Forty-fifth St., n s, 200' w St. Ann's Ave., four-st'y brick tenement, flat tin roof; cost, $12,000; owner, Robert Schwend, 31 Lewis St.; architect, Adam Munch, 307 East One Hundred and Fifteenth St.

Fifty-fifth St., s s, 150' e First Ave., two-st'y brick boiler-house and coal storage, flat tin roof; cost, $10,000; owner, Henry Elias, 158 East Seventy-first St.; architects, A. B. Ogden & Son, 409 East Fifty-third St.

Willet St., No. 29, five-st'y brick building, flat tin roof; cost, $8,000; owners, Chas. and Herman Gotthelf, 252 Delancy St.; architect, F. W. Klemp, 215 Bowery.

One Hundred and Fifty-first St., s s, 200' w Morris Ave., two-st'y frame dwell., flat tin roof; cost, $3,000; owner, Timothy Sullivan, 466 East One Hundred and Fifty-first St.; architect, R. Rogers, 115 Nassau St.

Forsyth St., No. 146, five-st'y brick tenement, flat tin roof; cost, $18,000; owner, Matthew Hoellerer, 139 Ludlow St.; architect, Julius Kastner, 744 Broadway.

One Hundred and Forty-second St., s e cor. College Ave., 6 two-st'y and basement brick dwells., flat tin roofs; cost, $24,000; owner, La Cast & Van Reper, 693 East One Hundred and Forty-third St., and 588 East One Hundred and Forty-third St.; architect, H. S. Baker, 693 East One Hundred and Forty-third St.

Eighty-first St., n s, 450' w Eighth Ave., 3 four-st'y and basement brick dwells., flat tin roofs; cost, $40,000; owner, Samuel Colcord, 400 West Seventy-ninth St.; architect, H. L. Harris, Ninth Ave., cor. Eightieth St.

Ninth Ave., s w cor. Sixty-ninth St., fronting on street, five-st'y brick tenement, flat tin roof; cost, $25,000; owner, Geo. J. Hamilton, 2078 Fifth Ave.; architects, Thom & Wilson, 1267 Broadway.

Sixty-ninth St., s s, 25' w Ninth Ave., 4 four-st'y brick dwells., flat tin roofs; cost, $80,000; owner, Geo. J. Hamilton, 2078 Fifth Ave.; architects, Thom & Wilson, 1267 Broadway.

Grand St., n s, 75' e Willet St., five-st'y and basement brick tenement, flat metal roof; cost, $18,000; owner, S. B. Clark, 496 Grand St.; architect, John B. Snook, 12 Chamber St.

Rivington St., s w cor. Lewis St., one-st'y brick stable, flat tin roof; cost, $4,000; owner, Felix Brown, 304 East Eighteenth St.; architect, William Graul, 12 Stanton St.

One Hundred and Sixty-sixth St., s s, 175' w Washington Ave., three-st'y brick dwell., flat tin roof; cost, $3,000; owner, Catharine Lynch, 1945 Third Ave.; architect, Arthur Arctander, 373 Willis Ave.

New Ave., w s South One Hundred and Sixth St., 6 three-st'y brick buildings, flat tin roof, Amherst and Connecticut brick front; cost, $60,000; owner, F. A. Seitz, 315 East Forty-second St.; architect, Joseph M. Dunn, 1193 Broadway.

West Fifty-seventh St., No. 517, three-st'y brick building, flat roof; cost, $3,000; owner, Conrad Stein, 521 West Fifty-seventh St.; architect, J. Kastner, 744 Broadway.

Third Ave., w s, 50' s One Hundred and Sixty-ninth St., three-st'y brick building, flat tin roof; cost, $5,000; owner, Christian Wetzell, 1293 North Third Ave.; architect, Charles Churchill, 777 East One Hundred and Sixty-fifth St.

Alterations. — *Pier* 40, *East River, foot of Pike St.*, one-st'y iron and wood building, to be raised one st'y, making the same two-st'y, peak roof; cost, $3,000; lessees, N. Y. Central & N. R. R. Co.; receiver, Joel B. Erhardt, 40 West Fifty-ninth St.; carpenter, Warren Rosevelt, 257 South St.

One Hundred and Twenty-fifth St., n s, 100' e Fourth Ave., three-st'y and attic stone and brick building, peak roof, cellar steps removed, area to be formed covered with glass and iron vault light, new show windows, new plastering, etc.; cost, $5,000; owner, A. Loher, 62 West Thirty-eighth St.; architect, Chas. P. H. Gilbert, 18 Broadway.

Madison Ave., s e cor. Fifty-ninth St., one-st'y brick and iron building, peak roof, extension, flat tin roof; cost, $3,000; owners, Merrimac & Monitor Panorama Co., cor. Fifty-ninth St. and Madison Ave.; architects, Carriere & Hastings, 57 Broadway.

West Thirty-first St, *No.* 448, four-st'y brick building, flat tin roof, addition; cost, $3,000; owner, Andrew Herrell, 448 West Thirty-first St.; architects, Thom & Wilson, 1267 Broadway.

Charles St., No. 120, three-st'y brick dwell., addition, peak roof; cost, $3,000; owner, Jeremiah W. Dimick, 31 Madison Ave.; architect, J. H. Whitenack, 734 Greenwich St.

Broadway, Nos. 31 *and* 33, five-st'y brick office-building, top loft to be partitioned off; cost, $7,000; owner, Wm. R. Astor, 22 West Fifty-sixth St.; carpenter, S. R. S. Schemerhorn, 10 Nassau St., Brooklyn.

West Fifty-third St., No. 7, four-st'y brick dwell., addition, flat tin roof; cost, $2,100; owner, J. Johnson, 7 West Fifty-third St.; architect, John H. Duncan, 237 Broadway.

Fifty-ninth St., s s, 520' w Eleventh Ave., two-st'y brick storage building, addition, flat tin roof; cost, $5,000; owner, Joseph Eastman, 1 East Seventy-second St.; architect, J. E. Terhune, 218 West Thirty-seventh St.

Philadelphia.

Building Permits.—*Broad St.*, n e cor. Washington St., engine-house; Geo. B. Newton & Co., owners.

Berks St., cor. Palethorp St., two-st'y factory; Geo. Buchanan, contractor.

Columbia Ave., w of Twenty-sixth St., 2 three-st'y dwells.; Jas. Dingee, owner.

Fairhill St., n of Cambria St., 3 two-st'y dwells.; Silas Walters, owner.

Summer St., w of Twenty-second St., 4 two-st'y dwells.; Wendell Smith.

Fifty-sixth St., cor. Chelsea St., 2 two-st'y dwells.; Henry Dillon, contractor.

Thayer St., between Huntingdon and Tasker Sts., 7 two-st'y dwells.; F. Dietrich, contractor.

Park St., n of Shunk St., 12 two-st'y dwells.; B. P. Evans, owner.

Ellsworth St., w of Sixteenth St., two-st'y stable; Harvey & McDaniel, owners.

Moore St., e of Second St., 2 two-st'y dwells.; David Doan, owner.

Jefferson St., e of American St., five-st'y factory; W. R. Douglas, contractor.

Olive St., w of Eleventh St., 3 two-st'y dwells.; Chas. McCaul, contractor.

Brown St., w of Eleventh St., 2 three-st'y dwells.; contractor, same as last.

North St., No. 520, five-st'y factory; J. S. Bird, contractor.

Germantown Ave., No. 5430, 2 two-st'y dwells.; H. H. Bugby, contractor.

Fourth St., n of Somerset St., church, 50' x 60'; J. F. Miller, contractor.

Hicks St., below Mifflin St., 19 two-st'y dwells.; A. L. Flanagan, owner.

Unity St., cor. Adams St., four-st'y hosiery-mill; F. H. Henry, contractor.

Edgemont St., cor. Division St., 2 two-st'y stores; Jno. McCann, owner.

Stiles St., w of Twenty-ninth St., 6 two-st'y and 8 three-st'y dwells.; Elkins & Wedener, owners.

Walter St., w of Twenty-ninth St., 42 two-st'y dwells.; owners, same as last.

Ninth St., n of Cumberland St., 3 two-st'y dwells.; W. K. Bower, contractor.

Leithgow St., n of Somersett St., 3 two-st'y dwells.; contractor, same as last.

Sixteenth St., s of Dickinson St., 5 two-st'y dwells.; Thompson & Bro., contractors.

St. Louis.

Building Permits. — Thirty-six permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

O. Koerner, two-st'y brick dwell.; cost, $4,500; W. Whri, architect; A. Whri & Sons, contractors.

Charles Dzengolenske, two-st'y brick store and dwell.; cost, $3,000; Henry Sudholter, contractor.

C. Lindenkohl & Co., two-st'y brick dwell.; cost, $4,000; C. Linnenkohl & Co., contractors.

John Waldman, two-st'y brick dwell.; cost, $2,500; H. E. Peipers, architect; J. H. Keefe, contractor.

Aug. Hausmann, 4 adjacent two-st'y brick dwells.; cost, $14,000; Aug. Beinke & Co., architects; F. Offermann, contractor.

Fred Cornwell, 2 adjacent two-st'y brick flats; cost, $4,700; A. W. Black, contractor.

Jos. Wonich, 2 adjacent two-st'y brick tenements; cost, $3,800; M. Ihlo, contractor.

St. Louis Stamping Co., two-st'y brick addition to warehouse; cost, $3,000; Aug. Beinke & Co., architects; sub-let.

Mrs. A. M. Bohle, 2 adjacent two-st'y brick tenements; cost, $3,000.

Henry Bewig, two-st'y brick dwell.; cost, $3,500; Henry Nagel, contractor.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII — Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. — No. 513.

OCTOBER 24, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE excitement of the elections in France recalls to M. Marcel Daly in *La Semaine des Constructeurs*, a curious reminiscence of the popular elections of 1848. One of the correspondents of *La Semaine* writes to the editor, remarking that the two great French legislative bodies contain many merchants and scientific men, besides lawyers and politicians, but few, if any, architects, engineers, artists or builders; and he suggests that as no profession would be likely to furnish men more accustomed to the administration of important and costly works, it would be in every way desirable, not only for the public but for the artistic and engineering profession, that one or more members of these should, by the united action of the rest, be placed in the Government, where their special knowledge would be of the greatest service to their fellow citizens. This is certainly an excellent idea, and M. Daly sincerely approves it, but, judging from previous experience, he predicts that some difficulty may be found in carrying it into execution. In 1848, the stormy year which came near converting the whole Continent into a group of republics, a general election was to be held in France, and M. César Daly, the well-known manager of several architectural journals, was inspired with the idea of securing the representation of the interests of art in the Legislative Chamber through the combined suffrages of the artists of Paris. A call was issued for a meeting of artists of all kinds in the Salle Valentino, an immense public hall of the time, to consider the matter. More than two thousand persons responded; the hall, the passages, and even the sidewalks outside were crowded with interested artists. Unfortunately for themselves, men of genius are not always gifted with great good sense or moderation, and the assemblage had hardly been called to order before quarrels began in the midst of it. The painters and sculptors distinguished themselves particularly by demanding that the poets should be put out of the meeting, saying that they were not artists, and had no right to vote on matters affecting the interests of art. A general squabbling among the different sorts of artists then arose, and at last M. Daly made an effort to put an end to the confusion by proposing that each group of artists should hold an election for delegates by itself, and that the delegates so appointed should meet and make a final choice of a candidate to be supported by the entire body. This suggestion was adopted by the meeting; but, as it turned out, the dissensions of the whole assembly were transferred to the separate divisions. Only a few of the groups could agree upon anything, and the movement completely failed. In commenting upon this reminiscence, M. Daly observes that although the liberality and concord which are now beginning to prevail among artists would probably bring about results very different from those of forty years ago, it is still desirable that in such matters some one group should take the lead, and he thinks that architects are particularly fitted to do so. While their sympathy with all forms of art is usually both intimate and intelligent, they are free from the prejudices of cliques, and their experience in responsible administration, together with their judicial habits of thought, make them, as M. Daly says, the "natural cement" of an association of artists for business purposes.

THE *Builder* tells a story of a piece of Greek sculpture, which has recently reached the British Museum, after undergoing vicissitudes which exemplify admirably the tribulations to which the tender mercies of amateurs usually expose valuable antiquities which have the misfortune to come into their possession. About sixty years ago, Mr. Charles Robert Cockerell, a distinguished architect and antiquary, brought from Athens to England a beautiful sculptured bull, of Pentilic marble. On landing this object at London, from the ship, the sailors let it fall into the river. It was fished out, but the cost of getting it was so great that Mr. Cockerele abandoned the marble, rather than pay the charges, and it was carried to the Custom-House, where it lay neglected for several years. Here some one happened to notice it, and easily got possession of it; and soon sold it to a rich gentleman, who carried it away to adorn his estate in the country. This purpose was accomplished in a manner satisfactory to him by putting the Greek marble out under some trees on the lawn, and here it remained for nearly sixty years, soaked with rain, green with mould, and abraded by the drip from the leaves and branches over it. In this condition it was seen by Mr. Charles T. Newton, the celebrated keeper of the Greek and Roman antiquities in the British Museum, but several years elapsed before it was, probably through his influence, at last presented to the Museum by the descendants of the original purchaser. It would be interesting to know how many persons studied Greek art from this object during the sixty years that it lay mouldering under its yew-tree; and yet we often hear it seriously argued that antiquities are less useful in public museums than in the hands of private owners, who, as a rule, either thrust them quietly out of the way when they get tired of looking at them, as in this case; or do still worse, if they happen to feel, or pretend to feel, a real interest in them, by trimming them up and improving them until they are hardly recognizable. This country is too young to have many sins on its conscience relating to the treatment of antiquities, but we can ourselves remember a large fragment of sculptured Egyptian granite, which, in the days of our youth, stood solitary in a little grove belonging to a certain rich and scholarly family. Although not of great value, this fragment, before the importation of the New York obelisk, was perhaps the only bit of Egyptian monumental art on this side of the Atlantic; while in the clear cutting of its hieroglyphics, and the perfection of its polish, it surpassed then the obelisk itself. What may be its condition now we cannot say, but its owner seems to have done everything that he could to facilitate its decay, and thirty years of tree-drip and Massachusetts frosts have probably reduced it by this time to a mere boulder.

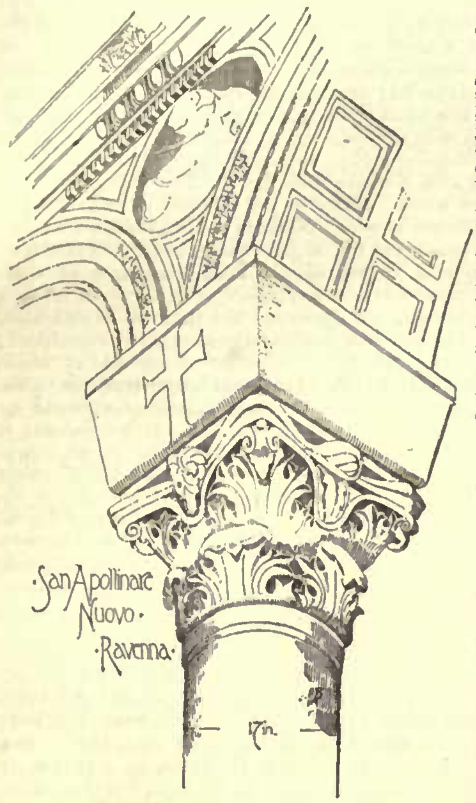
THE Chicago *Tribune* mentions some experiments which have been made in California for determining the economical value of crude petroleum as fuel for making steam, in place of coal. It is well known that many steamships and railway lines in Southeastern Russia use this fuel with perfect safety, and with excellent results; and in this country puddling-furnaces are often fitted with apparatus for burning petroleum; but the Central Pacific Railroad Company seems to have been the first to use it on an extensive scale for making steam. At present nearly all its steamboats, including the Oakland ferry-boats as well as the great transfer steamers for freight trains, burn nothing but crude petroleum from wells near the railway routes. As in the Russian boilers, the petroleum is burned in the shape of fine spray, driven into the fire-box by a jet of steam. There is no waste, and the cost of evaporating a given weight of water with the oil is little more than half that of using coal. The next steps in this important economical movement should certainly be the adaptation of the oil-burning processes to household use. In Russia much of the crude petroleum, which costs at the wells sixty cents a ton, is already utilized for domestic purposes, and anything that can be done with the clumsy stoves of the Russians could surely be done much better with the ingenious appliances familiar to American stove and furnace makers. The main difficulty seems to lie in the necessity for finding a substitute for the steam jet which, when the oil is burned under boilers, drives a shower of spray, in a suitable condition for burning, into the fire-box. Wicks are inconvenient with crude oil, and give trouble, even with refined oil where it is desirable to maintain a continuous fire, but

the devices at present used for converting the oil into spray on a small scale are not altogether satisfactory. If we are not mistaken, most of them depend in forcing out the spray upon the vapor of the oil itself, which is generated, when the fire is first kindled, by pouring a little oil into a cup under the nozzle, and lighting it. The presence of confined petroleum vapor may, however, seriously menace the safety of the building in which such a fire is kept up, and, above all things, petroleum-burning apparatus for houses should be made safe beyond a doubt: when this point is secured, the rest is easy. The substitution of an iron oil-tank under the side-walk or in the back-yard, with a pipe into the cellar, and a connection for replenishing from a travelling tank, for the dirty coal-bin would be worth many dollars every year to the householder; while the substitution in the furnace, for instance, of an oil flame, fed by an automatic valve, for the coal fire with its laborous attention, would be of even greater value. There is nothing impracticable about this, and if, as the Chicago *Tribune* says, one hundred gallons of crude oil, worth about three dollars, will do as much heating as a ton of coal at five or six, there ought to be a great field for inventors in this direction.

THE *Scientific American* quotes from the *Chronicle*, of Orange, N. J., a paragraph to the effect that Professor Paddock, of the Stevens Institute at Hoboken, has come into possession of a telephone used by Philip Reis, of Frankfort, in Germany, about the year 1861. At that period Reis published a paper upon the possibility of conveying speech to a distance by means of electrical currents, and described devices for attaining that end. The paper attracted much attention, and was well known to scientific men long before Professor Bell devised his famous apparatus for accomplishing the same object. It does not seem to have been certainly known until recently whether Reis, who died shortly after the publication of his essay, ever constructed and used a telephone upon the principle which he devised; and during the first serious contest in the courts over the originality of Professor Bell's invention, when the Reis description was quoted as evidence that the telephone was invented fifteen years before Professor Bell's patent, the advocates of the Bell Company proved, to their own satisfaction and that of the court, that a telephone constructed according to Reis's directions could not be made to transmit articulate sound. As no other successful attempt at long-distance talking seemed to have been made before Professor Bell's, the court, mainly, as it appears, on the strength of this evidence, declared him entitled to a monopoly of "all forms of electrical transmission of speech." This grant to the Bell Company of the exclusive privilege of talking over wires shut out at once from public use several other forms of telephone, some of them much superior to that of Bell, if we can believe the descriptions of their work; and the inventors of these very naturally, in their own interest as well as that of the public, determined to test, if possible, the question of the practicability of the Reis telephone, upon which the decision of the court turned. For this purpose investigations on an extensive scale were begun. Advertisements were inserted in the technical journals of Europe, requesting information as to the experiments of Reis; and the acquisition of instruments actually used by him seems to have been a result of these efforts. According to the statement in the Orange *Chronicle*, one of these instruments was exhibited by Reis at a lecture, the text of which afterward formed the substance of his published paper. This instrument, so far from being incapable of transmitting speech, has been set up without alteration in Professor Paddock's house, and connected with a transmitter in his stable, three hundred and fifty feet distant, and words, sentences, and the words and music of songs have been distinctly heard through it, although the electrodes would naturally have been so corroded, and the membranes so stiffened, by the lapse of a quarter of a century, as to diminish greatly its sensitiveness. With other instruments made by Reis, including both the transmitter and receiver, a sentence of fifty-six words was sent intelligibly, although the transmitter was made without carbon points, and an ordinary knitting-needle was employed in the receiver. These results, to which Professor Paddock's high standing would seem to give authority, must, unless the story in the Orange *Chronicle* is a fiction, materially weaken the claims of the Bell Company in regard to the impracticability of Reis's telephone, and one hardly sees how a judicial decision based on these claims could long be sustained. If, on appeal to the United States Supreme Court, the decision of the Massachusetts court should be reversed, Professor Bell's patent will sink into a mere monopoly of a certain mode of transmitting speech by electrical currents, leaving the way clear to all who can devise different or better ways of doing the same thing to come forward and earn the public favor by superior service if they can. So far as the public is concerned, this is a thing to be greatly desired; and without wishing to detract in the least from Professor Bell's merit, or from the profits of those who have invested money in his monopoly, most people would, we think, be glad to see the field of telephone service opened to competition.

A CURIOUS surveying instrument is described in the *Builder*, which is capable, not only of measuring the heights as well as the horizontal distances of various objects from a single station, but plots automatically on a board fixed to the stand of the instrument the exact position of the points under observation, at any desired scale. This wonderful instrument, which is the invention of Professor Cerebotani, of the University of Verona, consists essentially of two telescopes, one fixed and the other movable, carried at the opposite ends of a strong steel bar. In taking observations the instrument is placed with this bar in a perfectly horizontal position, and both telescopes are then directed upon a given object. Of course, only things in the same horizontal plane with the telescopes can be seen through both of them at once, and if the object whose position is to be ascertained is above or below this plane, a point at the proper distance above or below it is first observed. It is evident that when both telescopes are trained upon the given point, two lines passing through their axes will intersect in that point, and will form, with the line of the steel supporting bar, a triangle, the base of which is the length of the bar. It would be easy, with a horizontal circle, to read off the angle of convergence of the two telescopes, and calculate from this the distance of the object; but Professor Cerebotani accomplishes the same result still more easily by attaching a drawing-board to the stand of the instrument, over which a straight-edge is carried by the motion of the movable telescope, in such a way that while the straight-edge is always parallel with the axes of the movable telescope, one end of it remains always at the same distance from another straight-edge parallel to the axis of the fixed telescope. This distance is made an aliquot part of the length of the steel supporting bar, and when the two telescopes are made to converge upon a given object, the straight-edge at the same time intersects the fixed index, forming a triangle on the board exactly similar to that formed by the imaginary prolongations of the axes of the telescopes, but having for its base a definite fraction of the length of the steel bar, instead of the steel bar itself. Supposing the ratio of the base of the triangle formed by the straight-edges to be to the length of the steel bar as one to twenty, the distance of the object viewed will be twenty times the length of the portion of the fixed line cut off by the movable straight-edge when both telescopes are trained upon it. For rough work this distance might be read directly from the index, but in practice a micrometer screw is used to determine the exact length, and the reading of the micrometer is interpreted by a table which is sent out with the instrument. The horizontal distance of the object being thus ascertained, its height is easily determined by the movable telescope turned in a vertical circle, the altitude being simply the product of the horizontal distance by the natural tangent of the vertical angle observed. The two straight-edges, as their position shifts over the board while the instrument is turned to different points, afford the easiest possible means for plotting the positions of all the points upon a sheet of paper fixed to the board, and a map of a given district may virtually be drawn by the simple process of looking at different portions of it from a single point. As the length of the steel bar which forms the base-line of the main triangles is liable to vary by expansion and contraction, perfect accuracy in surveying with the new instrument can only be obtained by laborious correction of the observations; but for rough work, where an error of one foot in two hundred, which is believed to be the maximum with careful handling, is unimportant, the Teletopometer, as its inventor calls it, is likely to be useful; and it is said that military engineers are already experimenting very successfully with it.

ST. ALBAN'S.



ALL that now exists of the once famous abbey is the church, which is situated upon a hill above the site of the ancient city of Verulam, and whence the saint proceeded to his martyrdom, on the scene of which arose the monastery. In obscure days when a British town consisted of a collection of huts protected by earth-works and a ditch, and surrounded by woods and morasses, the River Ver gave name to the encampment here situated.

Alban lived in the third century, in the reign of the Emperor Aurelian. In his youth being given to learning, he travelled to Rome to pursue his studies; and when he returned to his native city of Verulam, he seems to have been treated with honor both for his love of letters, and also for his virtues, particularly those of hospitality and charity. But troublous times were at hand, and when the Empire suffered the dreadful persecution under the edict of Diocletian, it was caried out in Britain by Maximianus Herculius and Asclepiodotus (St. Alban's Chronicle, a MS. in the library of Lambeth Palace). It appears a deacon of the Christian church, one Amphibalus, pursued by the people, took refuge in Alban's house, where he was concealed by its owner. Alban struck by his guest's resignation, and enlightened by his teaching became converted; but the enemy soon discovered the place of retreat, and Alban hiding Amphibalus put on his raiment and gave himself up to the soldiers, refusing equally to betray his friend or to sacrifice to the idols. He was first tortured and then led up the neighboring hill to be beheaded. A great multitude followed, and to reach the place of execution they had to pass the River Coln; but the bridge was narrow; so Alban prayed, and lo! the waters divided, and thousands of persons passed over dryshod. On reaching the summit of the hill the saint prayed for water, and his thirst was stayed; and then falling on his knees, and bending his neck to the executioner, his head was struck off, and he received his crown of martyrdom. This is the Venerable Bede's account, and he adds that in his time there existed a church of wonderful workmanship (A.D., 731). Matthew of Westminster also concurs in this statement (A.D., 313); and Giraldus Cambrensis, who lived about 1300, speaking of edifices erected to the memory of St. Alban, mentions the abbey and also one in Wood Street, London, founded also by King Offa, close to his palace. The date of St. Alban's martyrdom is placed by most authorities on June 22; the year ranging from 286–305. This is sufficient proof (for of the existence of the martyr there is no question) that Christianity was common in Britain three hundred years before the so-called "conversion" by St. Augustine. Every one knows the pretty story of St. Gregory seeing the pagan English children in Rome's market-place, and saying "*Non Angli, sed angeli!*" But even allowing that the men of Kent were at that time (the end of the seventh century) immersed in paganism, the fact that Augustine had great difficulties in Romanizing the rest of the country, and the hostility of the British bishops, proves that he only "converted" a small part of the island. At that time the British church derived its customs, rites and ceremonies from the Eastern ones, and its metropolitan was the bishop of Caerleon-on-Uske. Augustine would not agree to this state of things, and so he deposed the recalcitrant bishops, made over their sees to his friends, acknowledged the bishop of Rome as his chief, and for his reward received (601) the pallium as first Primate of England.

But the history of the church really begins in the year 793, when Offa II, King of the Mercians determined to calm his conscience (unduly upset by the murder of Ethelbert, the East Anglian King) by the erection of a monastery worthy of being dedicated to the great martyr's memory. Thereupon, Offa dug up the saint's coffin which had been buried under the green sod when the Saxons destroyed the church, and found it, containing not only the remains of St. Alban, but also the relics placed in it by Germanus. The King placed a golden circlet upon the head inscribed "*Hoc est caput Sti. Albani*," and caused a reliquary to be made of gold and precious stones in which the relics were placed, the whole being carried in solemn procession to the little church which he had repaired.

Offa went to Rome and obtained permission of Pope Adrian I to appropriate the *Peter's pence* collected throughout his kingdom for the abbey. This was a levy of a penny from each family holding lands producing thirty pence annual rental; it was originally levied by the West Saxon King Ina in 1727, for the maintenance of a Saxon college at Rome, and was subsequently called *Peter's pence*, because it was paid on the first of August, the feast of St. Peter *ad vincula*, being the day on which the bones of the martyr was discovered. The Romanist writers, Polydore Virgil and Cardinal Baronius have represented, erroneously, that it was a sort of submission to the Pope, and that Offa thereby made his kingdom a fee of the Roman See (Nicholson). On his return from Rome Offa placed the monastery under the rule of St. Benedict, introduced into England by St. Augustine, and gave it lands and a charter. This and a multitude of MSS. referring to the history of St. Alban's, are to be found in the British Museum, and in the libraries of Lambeth Palace, and of some of the colleges at Oxford and Cambridge.

The earliest portions of the present church were built in 1077, by the Abbot Paul of Caen, a kinsman of Lanfranc, Archbishop of Canterbury. He constructed the church entirely afresh, using stones and tiles from the ancient city of Verulam, which may still be seen in the tower, transepts and eastern part of the nave. From this time the monastery increased in riches and importance: it became the house of reception for the sick, a school, and also what might now be termed a hostelry.

The next abbot, Robert de Gorham, built the chapter-house and cloister (now destroyed) and repaired and re-adorned the Feretry of the Martyr. (A feretry, *feretra*, seems to have been the reliquary, not the entire immovable shrine; although the term has sometimes been applied by ancient writers to the entire structure). It was also during Robert's abbacy that the mitre was assumed, this enabling an abbot to assemble the clergy, to prescribe rules for his convent, and above all to be independent of any episcopal supervision: thus making the mitred abbots of greater importance than the bishops: indeed, at the dissolution of the monasteries, they are said to have far out-numbered the bishops in the House of Lords.

William de Trumpington raised a lofty lantern on the tower, and completed the change at the west end of the nave, begun by his predecessor. Matthew of Paris, the historian, adopted the religious habit during this abbot's time, 1217. At the coronation of Henry III, John de Hertford seems to have assumed the first place after the bishops, by reason of his patron saint being proto-martyr of England, an assumption which gave rise to continual squabbles between the abbots of St. Alban's and Westminster. In 1239 the Legate Otho excommunicated the Emperor with much solemnity at St. Alban's. In 1256, the abbey was placed under an interdict for refusing the exactions of the Papal collectors. Matthew Paris died in 1258, and his "Lives of the Abbots" end with John. An Eleanor Cross was erected here, shortly after the progress of the Queen's body from Herdeby, near Lincoln to Westminster; but it was unfortunately demolished in 1702 to make way for a market-house.

The Lady Chapel with its ante-chapel was finished by Hugh de Eversden. This abbot was twice besieged in his abbey by the townsmen on the question of rights and privileges; the latter gaining their cause. But the next abbot obtained the surrender of all the privileges, and the town was obliged to submit to him. These privileges were very important. For instance, in 1264, a tumult arose concerning the abbey mills. The people denied the right of the abbot to force them to full their cloth and grind their corn at his mill on his own terms; and although the dispute was decided in favor of the abbot, he was obliged to promise to be more modest in his demands for the future. The abbots were magistrates and judges, even in cases of capital offences; they had the power of imprisoning delinquents and even of returning representatives to Parliament; privileges which one can understand would easily become opportunities for oppression. As an example of the enormous wealth and power of the abbots, it suffices to say that Thomas de la Mare rebuilt the great gate with its chambers, prisons and vaults; repaved the west floor, and expended £4,000 on the fabric, and £1,167 on the services of the church; enormous sums of money in those days (1380).

The abbey was a famous school of painting and gold and silversmith's work. Matthew Paris mentions two remarkable reliquaries covered with image of gold, made by Richard d'Albencio, or Albuii, or D'Aubeney, and no doubt many of the early chalices, etc., came from St. Alban's.

Printing had been introduced at St. Alban's in the same year as at Westminster. Caxton's first work, the "*Chronicle of England*" appeared in 1480, and although the same work did not appear at St. Alban's until 1483, the "*Rhetorica Nova Fratris Laurencii Gulielmi de Saona*" had been printed in 1480.

In 1489 Innocent VIII issued a Bull for the reformation of convents, and the Legate admonishes the abbot and monks of St. Albans to mend their ways; he had heard that "they were given to simony, usury, lavish expenditure, and even great violation of good morals. Cardinal Wolsey held the abbey *in commendam* in 1521, but he never seems to have lived there. At the dissolution of the monasteries Richard Boreman seems to have submitted to the royal commissioners without opposition; indeed he was probably placed there for the purpose. The possessions were quickly dispersed amongst Henry's favorites, and the abbot and monks pensioned off. Stevens in 1722

writes, that the value of the lands formerly belonging to the abbey was at that time some £200,000 a year. Sir Richard Lee was the fortunate possessor in 1540, and he had scarcely gained when he began demolishing them. In 1553, a charter made over the Lady Chapel to the mayor and burgesses for a grammar school; and the church was sold for £400, to be turned into a parish church.

The church has little external ornament; its form is that of a Latin cross, the axis pointing about twenty degrees to the south of the east, a common way of building old churches. The earlier portions, — are built of Roman bricks, the later of stone. The entire length from east to west is 548 feet, the nave is 215 feet long to St. Cuthbert's screen, and 284 feet to the tower; the width of the transepts 189 feet, and the height of the tower 144 feet. At the end of each transept are cylindrical turrets, and probably the great tower had originally four similar ones. The roofs were flat a few years ago, but now are high-pitched, the opinion being held by many that they were so originally. But it is objected, that if the roof was originally high-pitched, the weathering on the tower would not have passed under it; it would have stopped where the roof bisects it. The authorities differ as to the date of the low roof; some stating it to have been built in 1323, some early, and some late in the fifteenth century. The high roof certainly dwarfs the tower, and entirely changes the general, and formerly quaint, effect of the building. Another unfortunate restoration, was the pulling down of the unfinished west front, and Perpendicular window, and the substitution of an entirely new Early English design by Sir E. Beckett. [see Illustrations.] This is done at his own cost of £20,000, and was the subject of as many verbal fights as the "battle of the roof." The south side of the nave has also been encased in new stone. That all this is a blunder, posterity will pronounce, if this generation does not. If a church is to be torn about, if "late" work is to be destroyed, and the "original" style substituted, where is the line to be drawn? Here is a building begun in Norman times. If a Perpendicular window is pronounced "base" and unworthy the edifice, why not also an Early English. If a Tudor monument is to be banished, why not a Perpendicular one? Who is to be the umpire to decide up to what period architecture remained "pure?" As to the modern work of the west front, it is heavy, spiritless and mean; the finials are the clumsiest to be seen anywhere, the ornaments the poorest; and in order to fill up the end of the roof, five lancet windows have been placed above the parapet over the porch; these can only give light to the loft in the roof, as the ceiling of the interior is flat. The buttresses are described as "massive" (!) Abbot John de Cella (1185-1214) conceived the idea of pulling down the Norman west front and rebuilding it in the Early English style of his own time. The three portals were finished, but early in the eighteenth century, the aisle ones were mutilated, and blocked up with their own fragments, the new front is therefore meant to be a reproduction and restoration of de Cella's design, but there is neither the spirit nor the grace of real Early English work in it.

The nave is a remarkable example of changes of style from the Norman to the Decorated periods. On the north side, the place where the Norman gives place to the Early English should be noticed. The clustered Early English shafts of the sixth bay spring out of a Norman pier, and the clerestory window above is Early English, although there is but one, instead of two. The six Norman piers on the north side belong to the original structure of Abbot Paul de Caen (1077); then succeeds the Early English of William de Trumpington. The first three arches on the south side are like those of the north, but the shaft which supports the fifth arch is larger than the others and is flat on the north and south sides; this is the juncture of the Early English and Decorated. The outer mouldings of the Decorated arches terminate in sculptured heads, supposed to be those of Paul the Abbot, King Offa and Editha, Queen of Edward the Confessor. John de Cella, as we have said, destroyed the Norman façade, and was unable to rebuild it, bringing upon himself, says Matthew Paris, the jeers of his fellows; "This man began to build and was not able to finish." His first builder, one Hugh Goldcliff seems to have been "a man deceitful and false, but an excellent workman," and the abbot had to limit himself to the construction only of the three beautiful portals. Of these Sir G. Scott said, "I doubt whether there exists in England a work so perfect in art, as the half-ruined portals of St. Alban's. I venerate the architect who designed them, who, I believe, was Abbot John de Cella's second architect, Gilbert de Eversholt. His work is contemporary with two others, which are as fine as almost any in existence; the western porch at Ely, and the Choir of St. Hugh at Lincoln. All of these were the works of the earliest perfected Early English, after it had thrown off the square form of the Romanesque capital." And yet what remained of these porches was demolished; although of course the new work is only a "restoration!" Hugh de Eversden (1308-1326), rebuilt some of the south aisle which had given way. The ceiling is flat panelling (painted) of the fifteenth century, but very little of it is of that date. Some old frescoes were discovered in the nave, of a very rude character, probably of the thirteenth century; they are in distemper, and represent the Crucifixion, a St. Christopher and an Annunciation. The rood-screen, separating the nave from the choir is Decorated; it is called St. Cuthbert's screen, Richard de Albencio having built a chapel in honor of St. Cuthbert's cure of a withered arm, and after the abbot's visit to the saint's shrine at Durham. During the late restorations a remarkable discovery was made in the choir, the ceiling had been repainted in the seventeenth century, and upon this being removed, the original fourteenth-century paintings were brought to light. They represent monograms, arms, legends and shields, and have carved and gilded bosses at the intersection of the ribs. In the choir, and also in the north transept are some more frescoes. In the south aisle of the choir is a beautifully-carved oak door, ornamented with crockets and pinnacles; probably an entrance to the cloisters. At the south end of the south transept, is a short passage or "slype," which communicated with the cloisters. On each side of it is a series of intersecting semi-circular arches, with elaborately-carved capitals; the only example of late Norman work here. The part under the tower is all Norman work. Many of the columns of the triforium are Saxon baluster shafts, to which Norman bases have been added; probably they were remains of the original Saxon church. The screen behind the high altar is a fine example of Perpendicular work, composed of a central cross (on which probably there was formerly a figure) and thirteen niches; but figureless like those at Winchester, which it resembles. The Purbeck marble pavement is old, repolished; and a flight of five steps leads up to the altar, on one side of which is the chantry of Abbot Ramryge (1492-1521), opposite this is the tomb of Abbot Wallingford (1476-1484), in which (covered-in by glass) is one of the most beautiful monumental brasses extant; it bears the effigy of an abbot in full pontifical vestments under a canopy, Thomas de la Mare (1349); it is believed to be Flemish. There are a few other brasses, but all more or less mutilated. A curious inscription on a slab near this is supposed to refer to John de la Moote, who conspired against King Richard II: "*Hic quidam terra tegitur, peccati solvens debitum, cui nomen non imponitur, in libro vitæ sit conscriptum.*" "One is here covered with earth, paying the debt of sin, whose name is not placed on this record. May it be written in the Book of Life." The north aisle is Early English, and contains a curious fresco on the wall of St. Thomas's incredulity, and in the ceiling a representation of the martyrdom of St. Alban. The pulpit, choir stalls and font are modern. Camden in 1586, speaks of a brass font, in which the children of the kings of Scotland were baptized; and Weever states that it was in the church in his time, 1631. But Fuller (Worthies, 1662) records that one Hickman, an iron-monger and a justice of the peace, took it away; as he says, "it was taken away in the late cruel war, as it seems by those hands which suffered nothing how sacred soever to stand, which could be converted into money. There is a wooden one to supply its place, which is said to be made of the same shape with the old font." This was replaced by one of marble, now in the Abbot's Cloister. Whether the modern is a copy of the marble one, which in its turn was a reproduction of the wooden one, there is no evidence to show.

On entering the south aisle of the saint's chapel, is the Perpendicular chantry of Duke Humphrey of Gloucester; it is believed to have been erected by Abbot John of Wheathampsted. The iron grating is thought to have been erected prior to the chapel, and to have been intended to give pilgrims a view of the shrine in the centre. About 1847, some portions of carved Purbeck marble were found blocked up in the arches at the east end of the saint's chapel. These the late rector, the learned Dr. Nicholson, thought were part of the shrine; and in 1872, when a quantity of material was removed which closed up a Perpendicular doorway in the south aisle of the Presbytery, some more pieces of the same kind of carving were discovered. There were about two thousand in all, which have been most cunningly put together, and enable us to form a perfect idea of the magnificence of the shrine in former days; it is of fourteenth-century work, and is of course only the base on which the *châsse* or reliquary rested; its form is oblong; the basement is solid, above which is a series of canopied niches, probably for the reception of offerings; this being surmounted by a cornice. Some of the sculptures remain, *e. g.*, the beheading of the saint, some angels censing, and a figure seated and crowned holding a church in his hand, doubtless King Offa II. Above the shrine was a canopy which was let down and drawn up as required. On the north side of the chapel is the Watcher's Gallery, of carved oak. In this the custodian of the shrine sat to receive the offerings, and place things upon the relics—linen and other things belonging to the sick. The same custom prevails now in many Continental churches, as for instance at St. Geneviève, Paris. Some remains of distemper painting, the back of an altar, are here to be seen protected by glass; also a very curious picture which was discovered in Duke Humphrey's tomb beneath the pavement. It is a canvass, and represents the vault as it appeared in 1703, when in digging a grave, a leaden coffin was found with the body of the Duke "in pickle—the corpse being entire—with a beautiful crucifix painted against the east wall at his feet, which is yet entire; but the body is now decayed" (Cole MS., dated 1747). On the left of the picture is the "beautiful crucifix," surrounded by four chalices, into which flows blood from the four wounds. On the right is the coffin containing a skeleton.

The Duke's monument is elegant Perpendicular work, bearing shields, with arms and monograms. Behind the saint's chapel is the ante-chapel, formerly desecrated by a passage, and now restored to the church. Here is all that remains of the shrine of St. Amphibalus, which is not nearly as perfect as that of St. Alban, nor can it ever have been of such fine workmanship. This too, is fourteenth-century work, but much later than that of St. Alban; it bears the initials of Ralph Witechurch, sacrist of the abbey during the time of Thomas de la Mare (1349-1396).

From this we enter the Lady Chapel, until quite lately used as a grammar school. It was the work of Hugh de Eversden (1308-1326)

and is of the richest Decorated style, particularly the side windows which are enriched with a number of little statuettes under canopies, upon the jambs and mullions. Sir G. Scott says of the east end, "it has an exquisite window above, consisting of a richly-traceried circle, placed within a curvilinear triangle, beneath which is a splendid range of niches, and beneath them again a gorgeous range of sedilia and piscinæ." The roof of the ante-chapel is wood groining, with carved bosses at the intersections, but little of the old work remains.

The only part of the monastery remaining is the Gate-House about one hundred and fifty feet west of the church. It was the main entrance, and was also used as a place for the incarceration of criminals. The arch is obtusely pointed, and has a groined roof. On the south side of the church, the spandrels of the arches of the cloisters can still be traced, all the rest has gone, destroyed by iconoclasts and restorers equally. Let us hope what yet remains may be saved from the Vandals. S. BEALE.

A REMARKABLE RULING.

O'Grady and Zerrahn vs. the Board of Court-House Commissioners, for Suffolk County, Mass., in Chambers, Supreme Judicial Court, October 13, 1885, before Justice Charles Allen. For plaintiffs, Messrs. Strange and H. E. and G. R. Swasey. For defendants, A. S. Wheeler and W. G. Russell.

DECISION OF JUDGE ALLEN: —

If I had any question in my own mind in regard to the substantial merits of this controversy, I should desire to hear the other side, and I should also desire time to take the case into consideration, in order to arrive at a more deliberate result. But I cannot see that I have any doubt or question in my own mind in regard to what ought to be the decision of the case upon the substantial portion of it.

There are three things, three elements, in respect to which it may be said that relief is sought in this bill. One is in regard to securing to the plaintiffs the sum of $1,000 as compensation under the eleventh article. The second is in regard to preventing the Commissioners on the Court-House from using any portion of the plaintiffs' plans in the construction of the building. The third, and more substantial part, is that relief is sought looking to further competition, *with a view to compelling the defendants to employ the plaintiffs as the architects for the construction of the court-house* [!], or perhaps, in other words, to restrain the Commissioners from employing anybody else —at any rate, for the present.

Now the last is the substantial part of the controversy. I do not suppose that there would be ultimately any controversy between the parties in regard to restraining the Commissioners from using any part of the plaintiffs' plans, without their consent. The plaintiffs have a perfect remedy for that in their own hands by not taking the $500.

Mr. Wheeler—We disclaim the right.

The Court—I understand that you do. But the substantial claim in this case is to prevent the defendants from going on in the line which they have marked out, and employing Mr. Clough to erect the building upon his plans.

Now, the first difficulty which I have in respect to that is an aspect of the case which has not been adverted to in the arguments for the plaintiffs, and which, to my mind is decisive; and that is, that even assuming that the construction of the prospectus, which is contended for by the defendant is correct, and that there is just such a contract as is contended for, still there is no ground for equitable relief. *Even assuming that the case had gone farther than this, and that there had been a vote by the Commissioners, selecting the plaintiffs as the architects to go on in the construction of the court-house, and accepting their plans, and then, for any reason, satisfactory to themselves, they decided to change their minds, a bill in equity would not lie on behalf of these plaintiffs, to compel the defendants to carry out their contract* [!]. A contract that is entered into upon that assumption is not a contract of such a nature that a court of equity will enforce it specifically. These defendants are public officers. They are Public Commissioners, intrusted with the duty and power of building a court-house — a great work, which it is understood will take three years' time. It is to be done under the supervision of some architect, with whom the Commissioners must have constant, intimate and confidential relations for three years to come. They must be in constant communication with him; and it is easy to see that it is not consistent with the public interest that Commissioners who are intrusted with this great duty and this great responsibility should be tied, as by a contract which a court of equity would enforce, to continue the employment of any architect, *under any agreement* [!], after they, for any reason satisfactory to themselves, wish to employ somebody else. The contract is of a nature that will not be enforced specifically in a court of equity.

Therefore, assuming the nature of the contract to be such as contended for, and assuming that the Commissioners had taken a step in advance of what they have done, and had actually selected these plaintiffs as architects for the construction of this building, a court of equity would not entertain a bill brought for the purpose of compelling the Commissioners to adhere to that employment throughout the whole of this time, after they had come to the conclusion, for reasons satisfactory to themselves, that they should dispense with the services of the architects whom they had employed. For that reason a demurrer would lie, and ought to be sustained, in my judgment, against this bill.

But I do not put the decision upon that ground alone, although it is satisfactory to my mind—but I do not think that upon a fair construction of this prospectus, these defendants have entered into any such contract as is assumed.

They say in the prospectus that they will select not exceeding ten plans having the highest merits. They have selected one plan. The language does not call for the selection of any more than one plan. They find that one plan is clearly the plan having the highest merit. Then, in order to prevent disappointment, or for reasons satisfactory to themselves, they go on and vote that each one of nine other architects shall have $500 apiece. *That I regard not as a selection of the ten plans having the highest merit* [!]. They have selected one plan as having the highest merit, and then they go on and make a further vote, that they will pay $500 to each one of those architects who chooses to take it. It does not seem to me that the true construction of this proposal binds the Commissioners, according to its phraseology, to do anything different from what they have done. There is no breach of any contract for which there is any remedy in any court.

Then, as to the point that the defendants intend to use the plans of the plaintiffs, the defendants disclaim any design of using them.

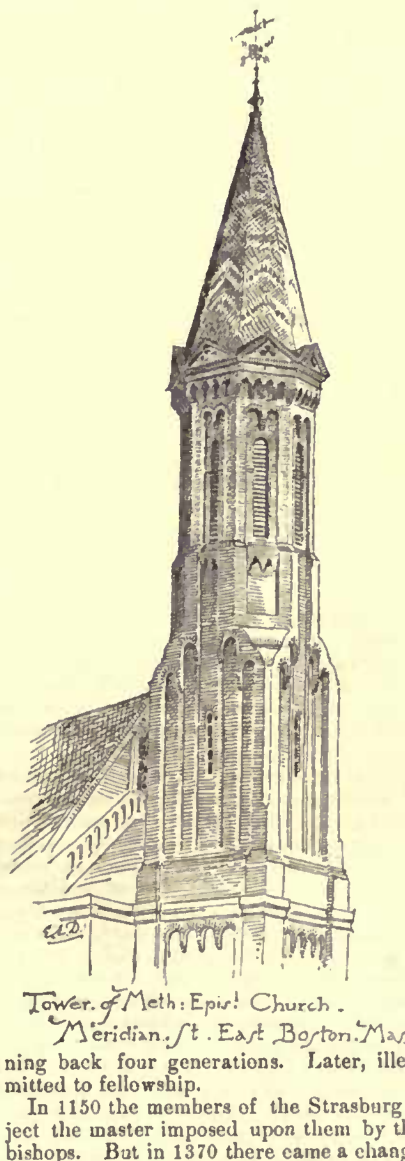
Then if there is any question here as to whether the plaintiffs are entitled to $1,000 for going on and completing those plans, after the Commissioners have decided that Mr. Clough's are the best, I do not think there is anything in that point.

Mr. Swasey—We should not claim anything like that.

The Court—I suppose it would be considered better for the plaintiffs to take the $500 for what they have done, than to go on and finish plans which would not be accepted.

For these reasons, being of the opinion that this case cannot be sustained, the bill must be dismissed.

HISTORY OF TRADE GUILDS. — II.[1]



Tower of Meth: Epis! Church.
Meridian St. East Boston Mass

IN 1368 and 1372 members of the guilds held seats in the city councils of Aix-la-Chapelle, Cologne, Mayence and Dortmund. With this great change in the external condition of the guilds there occurred also a marked change in their organization and life.

A concise outline of these internal changes only may be mentioned here.

Up to 1220 and especially in 1190, members of the guild elected their own masters, which proves that they possessed the right to decide who should be their leaders. Laws could only be enacted by the approval of the majority of all the members. Each member had a right to vote against the admission of a candidate.

This is a strong contrast to the condition of things in 1100. Then the masters of the guilds were chosen by the town council in the cities, and in the country they were appointed by the princes and the bishops. Even up to 1099 this was the rule in Strasburg. At that time every one who wished to become a fellow of a guild was required to prove that he was of free and legitimate birth, and possessed evidence of an ancestry running back four generations. Later, illegitimate persons were admitted to fellowship.

In 1150 the members of the Strasburg guilds had the right to reject the master imposed upon them by the town council, princes or bishops. But in 1370 there came a change. The old story of the increase of power and material strength must be told of the guilds, as it is related of all the classes from the highest to the lowest, who

[1] A consular report made to the Secretary of State, by James T. Du Bois, Consul at Leipsic, on Guild Organization in Ancient Times: Origin and Progress of Trades Unions: Power and Influence of the Organizations in the Middle Ages, and Condition of the German Guilds at present. Continued from No. 509, p. 149.

obtain position, power and wealth. The right to sit in the town council, the great market privileges, the increase of influence and power soon began to tell upon the pride and selfishness of the masters of the guilds, and they became in demeanor and by rulings nearly as exclusive and aristocratic as the aristocrats themselves. The old Strasburg rule was revived, that is, the rule which allowed only to free and legitimate-born persons the right of membership. Some of the guilds even excluded the children of the weavers, barbers, shepherds, millers, tax-collectors, revenue-collectors and musicians, because these were not free born. Among the soldiery used as garrisons in the different fortified towns each guild was assigned to a certain post and carried its own peculiar flag. To advance from fellow to master was rendered more and more difficult. The right of suffrage was taken away from the fellow. Formerly, to become a master a fellow was required to execute a masterpiece of work, and this piece was subjected to all the members of the guild for examination. This right was taken away and the masters reserved for themselves the right to pass judgment on the masterpiece, and thus could accept or reject any candidate whom they pleased. Each fellow was required to work one year in the place where he desired to secure a mastership, and upon admission was compelled to pay a certain sum of money. All of the quarrels among the masters and fellows or among the fellows themselves were decided now by the masters alone, and not, as formerly, by a committee selected by the fellows and masters. Every member had to promise to submit all of his quarrels to the masters before going to the civil or criminal courts for redress. This star-chamber court within the guilds existed in some places as late as 1840. At this date in Hamburg the court of lodges of the masons and stone-cutters had the right to punish a criminal with death. Against this right the criminal courts had no power to interfere.

Most of the masons and stone-cutters united their lodges and formed a grand union organization. This union, under the great lodge of Strasburg, comprised all the mason and stone-cutter guilds of Germany, France, England, the Netherlands, Spain, Portugal, Italy and Hungary. The chief master and high judge, residing at Strasburg in 1263, was subject to the authority of the archbishop of Milan and the Pope, but not to the Emperor.

Under this condition of things the power of the Emperor was greatly weakened. The petty princes of the country mastered and ruled the kingdom. The Emperor confirmed the laws of the guilds no more. This right was controlled by the princes and bishops, In the towns the masters secured more and more power, and played a very important rôle in the administration of affairs, and as their power increased the fellows of the guilds were forced gradually into a state of semi-serfdom. All of the affairs of the guilds were considered and decided by the masters in secret *conventus* (conventions); from this word originated the word *zunft*, as the fellows pronounced the word *zunventus*, *zunfventus*, and at last it was pronounced *zunft*.

The guilds were in this unhappy condition when the bitter struggle of the Reformation began. The troubled times which followed, especially the Thirty Years' War, destroyed, in a measure, the power of the guilds, and debased the comparatively high standard of German handwork which had existed up to that time. The workmen found employment difficult, and entered the military service. Such guilds as find employment at all times joined the garrisons of the fortified towns. Thus in 1631 we find the bakers of Leipsic fighting under the great Gustavus Adolphus.

When the Thirty Years' War ended German handwork had sunk so low as to be the subject of ridicule, and had there been a Commissioner Reuleaux in those unhappy days he would undoubtedly have originated the famous expression "cheap and nasty," "*billig und schlecht*," which the German commissioner to the Centennial Exposition applied to the exhibition made at that time by his countrymen, an expression which has done German commerce inestimable good, but which cannot with justice, be applied to German fabrications of the present, as under the impetus of this severe rebuke, they have begun a new and brilliant era in the art of handwork and manufacture which is already felt throughout the world.

One historical instance proves the condition of German handwork at the end of the Thirty Years' war. In 1520 Francis the First, of France, was obliged to send to Germany for his gunsmiths, locksmiths, etc. One hundred years afterwards France excelled Germany in all kinds of handwork. After the peace of Westphalia, when Germany began to recover from the exhaustion of destructive war, she found herself compelled to depend upon French models in most all of the branches of handwork. At this time the junkers and aristocrats were in absolute control of affairs, while the guilds had sunk very low and were devoid of both power and influence. Seldom could a master be found among the town councilmen, and those who succeeded in obtaining seats were very rich persons and were in reality manufacturers and not handworkers. Thus the masters found their former power and influence gone. They could no more assume an aristocratic air, but were forced into a decided opposition to the aristocracy. Two guilds alone seemed to maintain their former strength and influence — the merchants' guild and the *Universitas*, an institution possessing some of the characteristics of a guild. These continued their aristocratic positions. Indeed, the merchants belonged mostly to the patricians, and enjoyed all of the privileges of that class, and in some instances even greater privileges were bestowed upon them.

The other guilds, although forced into a bitter opposition to the aristocracy, and that, too, a powerless opposition, did not, however, return to the simple democratic principles which characterized their organization in the thirteenth century, but clung to the aristocratic constitution which had been forced upon them by the masters during the latter part of the fifteenth century, which had debased their fellows to semi-serfdom, robbed them of inalienable rights, forced apprentices into domestic servitude to the cost of their technical education, subjected the progress from fellowship to mastership to favoritism and position, and stayed the wheels of advancement and smothered the spirit of invention until the guilds became star chambers and tools which unscrupulous and tyrannical masters used to further their own selfish ends.

The little power that was left to them was exhausted in unorganized and fruitless opposition to workmen who were not members of the guilds or by quarrels with other guilds. Thus, the carpenters quarrelled with the joiners who made staircases; the joiners quarrelled with the carpenters who made doors; the glaziers quarrelled with the joiners and carpenters who made sashes out of soft wood; the joiners quarrelled with the glaziers who made sashes out of oak wood. The plumber was allowed to sell lamps, but not lamp chimneys, globes and wicks. The physician could prosecute the barber who prescribed a medicine, but the barber could not bring a process against a physician who bled and applied bandages, which in those days belonged in a measure to the tonsorial trade. The *Universitas* would always sustain its members, and it was all-powerful. The physician and the apothecary were members of the *Universitas*. Thus either could prosecute the druggist, but the latter had no right of process against the apothecary.

These quarrels only weakened the guilds and brought them into disrepute. The workmen had no prospect of becoming masters, because the aristocratic condition of the fifteenth century remained in force. Usually none but the sons of masters received a mastership. When a fellow married the widow of a master he was sometimes given a mastership. The result of this system was that incapable men often became masters. The fellows lost ambition and energy and hope, and the apprentice, forced into domestic servitude, learned little of his trade, and thus at the dawn of the present century the guilds presented a demoralized and disorganized union, without any great aims, and inspired with but little hope.

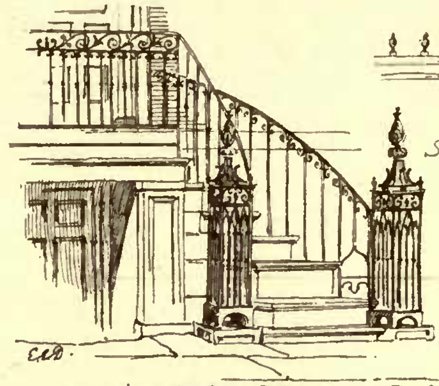
To add to this unhappy condition of the guilds, Napoleon Bonaparte forced French goods upon the German markets, and this competition was so great that thousands of German artisans were compelled to emigrate or to go into other pursuits. In 1815, when the German confederacy was formed, a great effort was made to revive the stagnant commerce, but no effort was made to elevate the sunken handwork. This suffered more and more, because many wares which were formerly made by hand were now manufactured by machinery; for instance, furniture, bronze articles, pottery, stoves, etc.

When, in 1847, the movement for liberty began, many of the leaders of the movement turned to the oppressed classes, especially to the hand-workers, and assured them that the success of the revolution would bring to them better times. Thus thousands and tens of thousands of the guildites were allured away from their organizations, especially away from the so-called *Morgen-Sprachen*, and soon found themselves joined to political societies. This naturally sapped the strength of the guilds, and weakened the bond of union to a great extent.

When the revolution was suppressed, in 1849, the social discontent among the laboring classes still remained. The workmen's unions were officially dissolved, but were secretly continued. At the same time factories began to be extensively built, and this was a serious blow to the hand-worker's art. The masters and the fellows showed a sullen hatred toward the introduction of machine labor. The former believed that they could compete with the factories by reducing the wages of the fellows. The fellows rebelled and much trouble ensued. The so-called political economists, law-givers, and people-happier-making demagogues came to the rescue. They did not recognize and treasure the fundamental principles of the guilds which had been of inestimable value for over two thousand years. They saw only the defects which had crept into the guilds during centuries of abuse and oppression. They did not heed the voice of history, which told them, in unmistakable words, that as soon as guilds had been suppressed, the necessity of reviving them had become apparent to the State. They saw none of these things, but blindly bent their energies toward suppression of the guilds and general free trade. They succeeded in Saxony in 1860, and in Prussia in 1868. The guilds were partly dissolved, while some of them were restricted and limited in such a manner that at last they yielded to the pressure and ceased to exist. Soon a number of fellows established themselves as masters, but having neither the ability nor education, they could not succeed, and hundreds were thrown into bankruptcy. The workmen who did not become masters, but lost their guild connections, naturally sought other connections, and thus they were gradually allured into the ranks of the socialists, and soon became social democrats and anarchists. The apprentices, who were compelled to pass certain examinations, would not study, and, deserting their masters before having served their time, applied to other masters as fellows, and were accepted, because no certificate of fellowship was required of them.

The manufacturer took young boys as apprentices, and instructed them in a careless and one-sided manner. For instance, in a machine-factory an apprentice was taught how to make rivets, and received

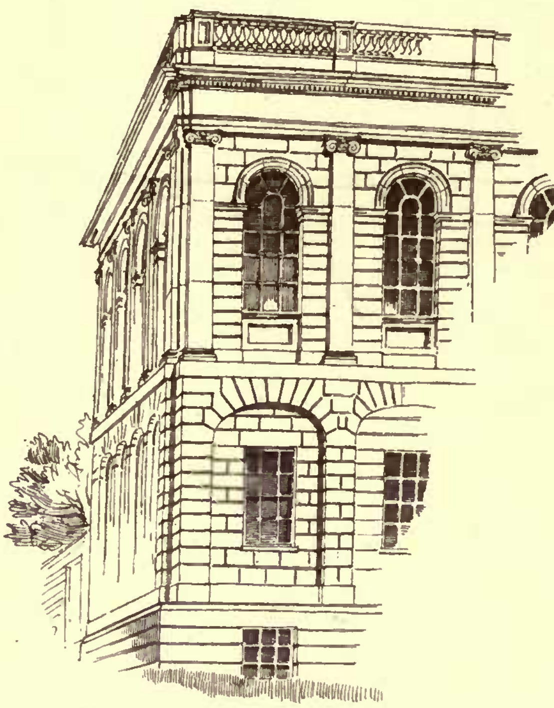
Sketches in. Albany. N.Y.



Old. Wrought. Iron. Newels & Rails



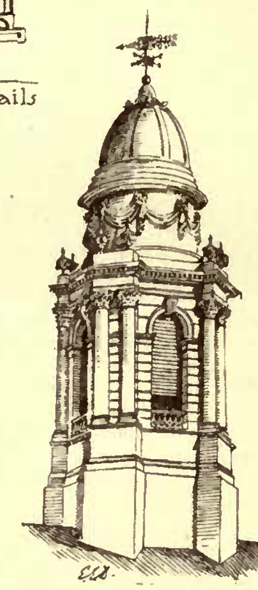
Spandrel. in. arch over old Gate.



One of the Wings.

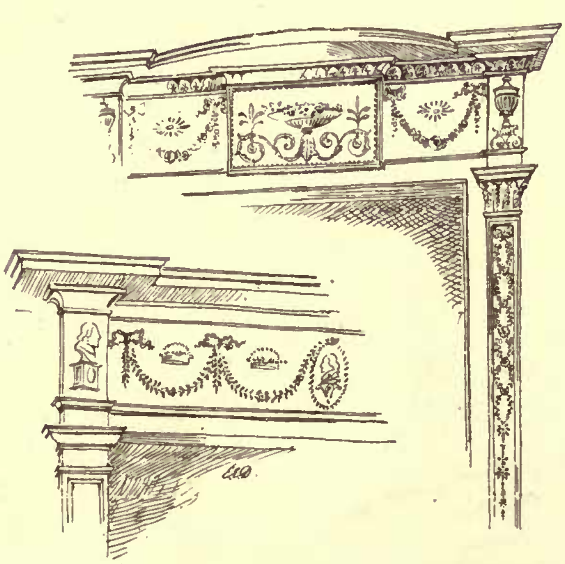


Chandelier in large School Room.



Central. Bell. Turret

The. Boys.' Academy. built. 1816. Ph. Hooker Archt.

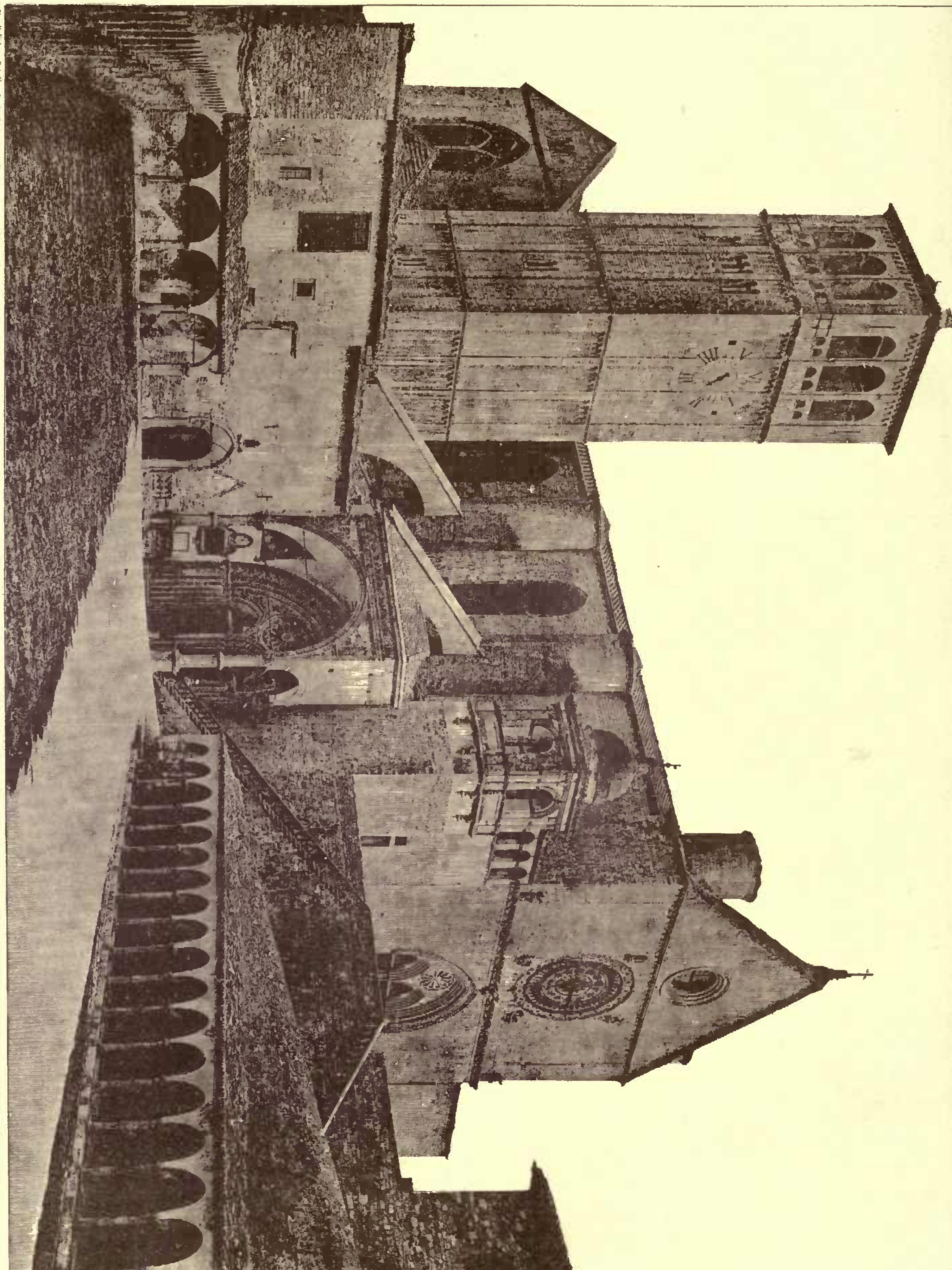


Doorways in old Mansion now occupied by the Fort. Orange. Club.



One. of. the. doorways. in. the. Hall. (Boys.' Academy.)

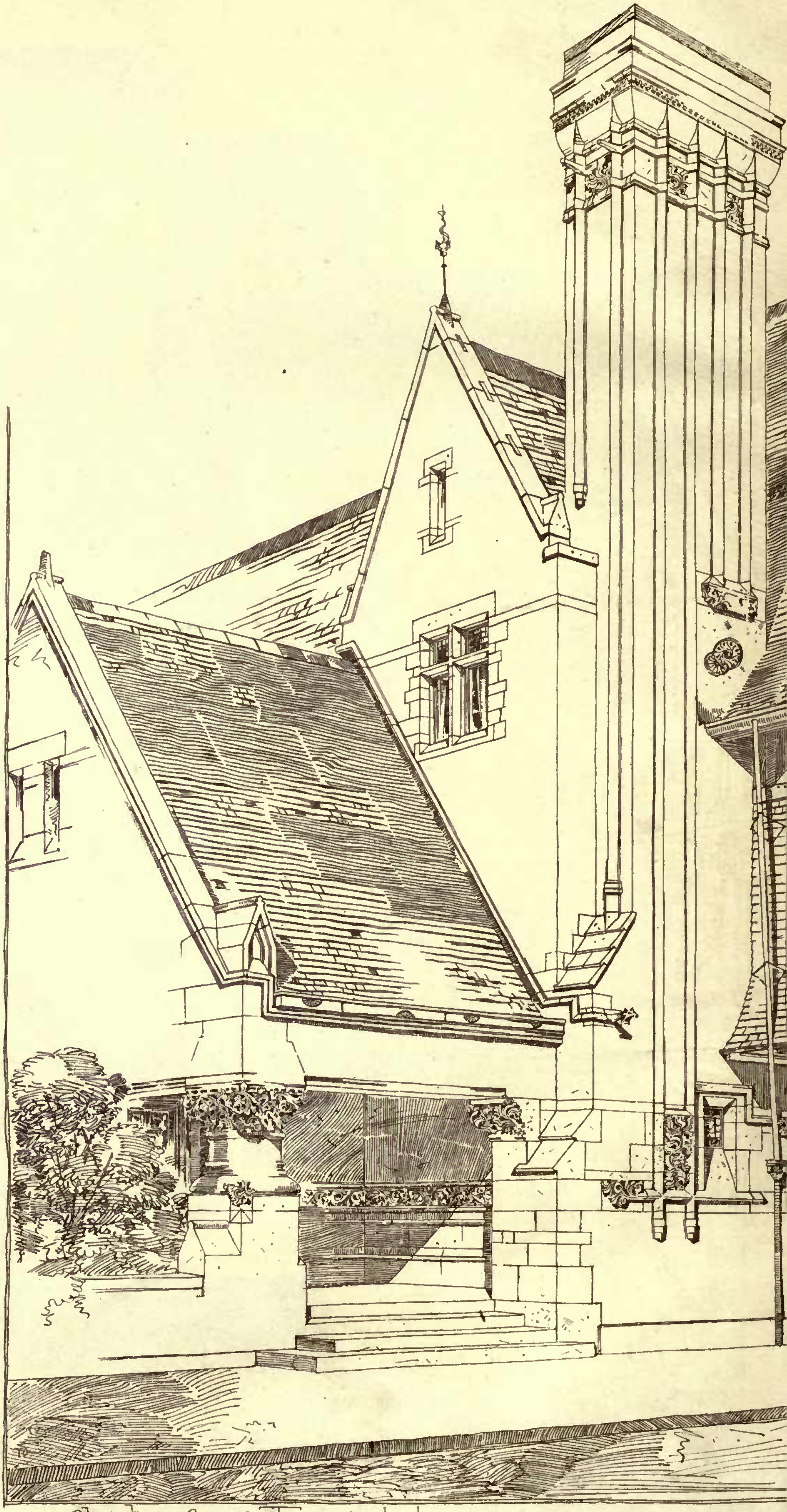
E. Eldon Deane. del.



The Heliotype Printing Co. 211 Tremont St. Boston.

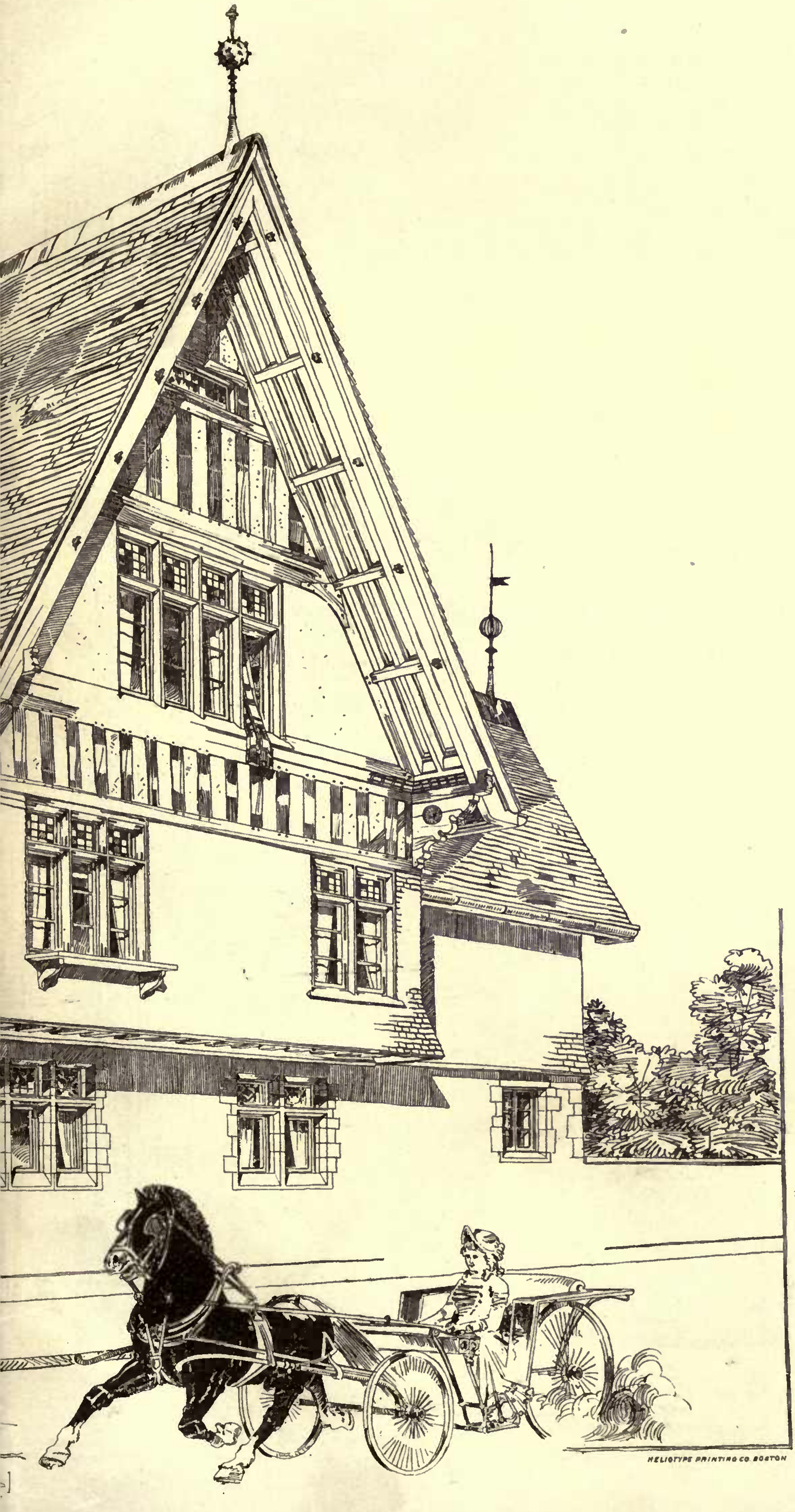
Church of St. Francis, Assisi, Italy.

AMERICAN ARCHITECT



Study for a Town House Henry P Kirby Inv

OSGOOD & CO

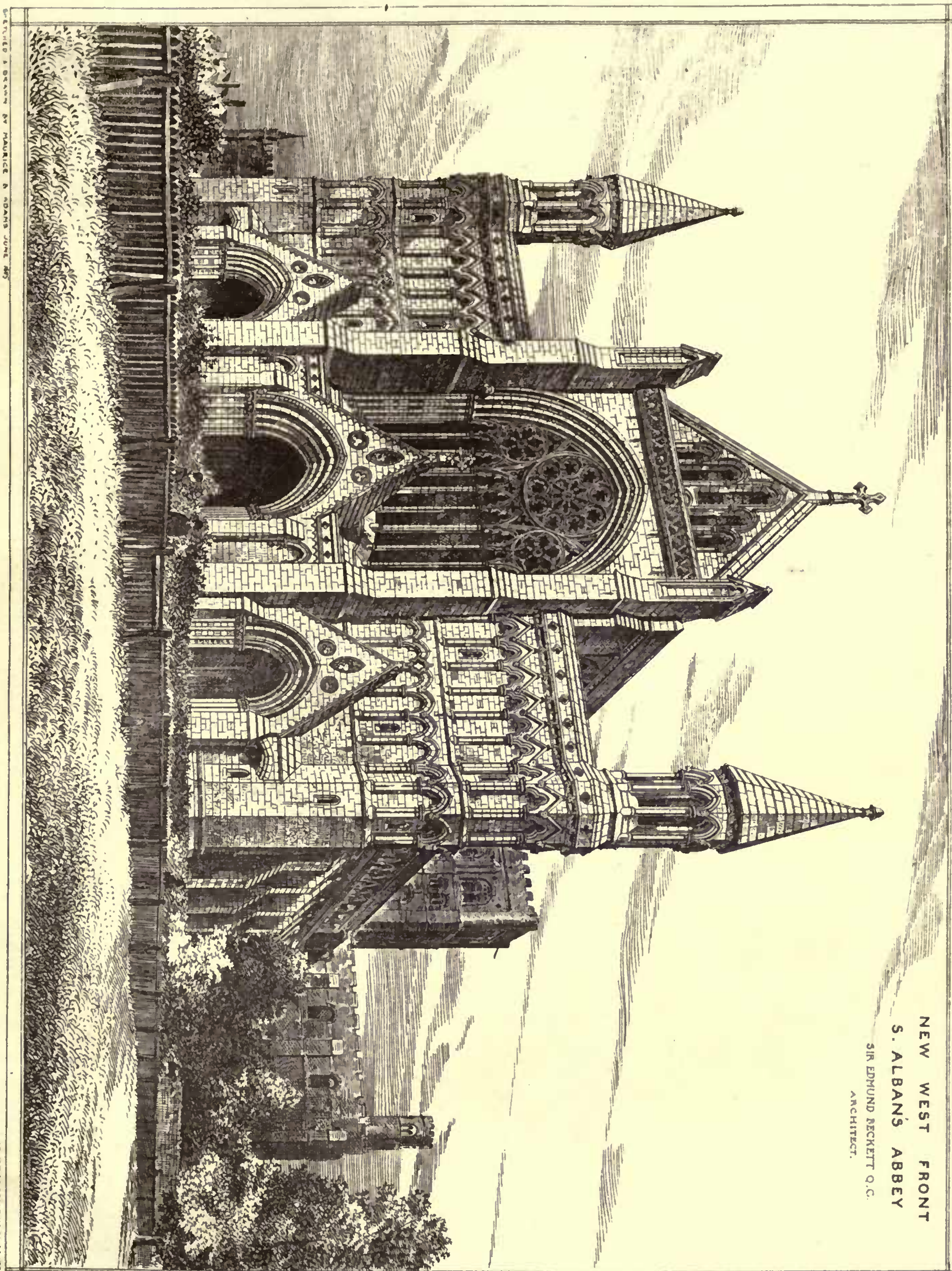


HELIOTYPE PRINTING CO. BOSTON



The Heliotype Printing Co. 211 Tremont St. Boston

Palazzo Comunale, Brescia, Italy.



NEW WEST FRONT
S. ALBAN'S ABBEY
SIR EDMUND BECKETT Q.C.
ARCHITECT.

from the manufacturer a certificate as locksmith. The tailor established himself as builder, and the mason went into the business of making implements. For this reason Commissioner Reuleaux was compelled to say of the German wares displayed at Philadelphia in 1876, "They were cheap and nasty."

Just now there is an effort on the part of the manufacturers to force upon the few remaining guilds the responsibility of caring for their breadless comrades. The manufacturers are strongly represented in the law-making department of the Government, and this effort may not be in vain. But there is a greater and far more significant movement on foot in the interest of the guilds, in fact a movement looking to their speedy and general revival. Laws to this end were enacted in 1878, 1880 and 1883, but the numerous manufacturers and jurists in Parliament have seen to it that these laws impose certain duties on the guilds, but do not give them any rights or privileges. Guilds under such circumstances cannot be of any use, and in fact cannot exist, as no one wishes to belong to a guild which is loaded down with obligations and restrictions but enjoys no privileges.

The guilds which do exist are now striving to take the apprentices away from the factories, where they are compelled to work much but have little opportunity to obtain a technical knowledge of their respective trades. This object is contained in the much spoken-of paragraph, 100 E, of Ackerman's proposition, which is now pending in the Reichstag, and which is opposed by the National Liberals, among whom are to be found a large number of manufacturers and stockholders. The guilds of Germany suffer constantly because the laws concerning them are ever being changed, and consequently they are continually forced to change their own rules and regulations. As an example, the following instance will suffice: The Leipsic tailors' guild enacted their statutes in 1284 for the first time, and were compelled to change them in 1390, 1540, 1650, 1720, 1773, 1819, 1848, 1860, 1870, 1873, 1878, 1880, and again in 1884. Thus a change occurred six times in five hundred years, and eight times in one hundred years, while during the past fourteen years five changes were forced upon the guilds. In this way, of course, no guild can achieve proper progress and development. Thus it will be seen that, owing to the frequent recent changes concerning the laws regulating the guilds, that scarcely had one law been enforced before a new one was proposed and adopted. A new era, however, seems to be dawning for the guilds, with some signs of its being a prosperous and successful era. Several guilds have recently established unions in different parts of the Empire. The guilds of Leipsic are on the point of uniting themselves, or rather of forming a committee representing all the guilds, for the purpose of endeavoring to secure rights which have been taken away from them and privileges which they sorely need. Many of these guilds have schools (*fachsschulen*), but these are more or less injured because of the compulsory rules of the city council, which force the pupils to attend the *fortbildungs schulen*, and they are also insufficiently sustained by the guilds themselves. The *facsschule* of the tailors' guild of Leipsic was beneficent from 1870 to 1882, but it has recently suspended because the teachers refused to obey the rules of the guilds; and as the guilds had no power over the teachers they could do nothing but stop payment of the guild money, and thus the school, for want of necessary funds, closed its doors.

The school established some time ago by the decorators' guild was suspended this year, because the city council did not approve of the place where the school was held. It is charged that this disapproval arose only because the city council wanted the pupils to attend the industrial school of the city instead.

The shoemakers' guild has a school which seems to prosper. The plumbers have a union throughout Germany, and a thriving school at Aue in the Erz Mountains. The turners have a union and a new school in Leissing, and also a newspaper. The paper-hangers have a school here and also a newspaper.

The Polytechnic Society of Leipsic has a Sunday-school, with several trade classes for watchmakers, locksmiths, painters, druggists and engravers, to which the respective guilds contribute.

These facts combined with the present national movement in favor of restoring the guilds to their former rights and privileges, and especially the spirit and energy displayed by the various trades in agitating the question, are all favorable omens for the guild system in Germany, and a prediction that in less than ten years the organizations will be a great power in the land is justified by current events.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE PALAZZO COMUNALE, BRESCIA, ITALY.

THIS, the town-hall of Brescia, has the special interest attaching to it that Palladio designed the windows; Jacopo Sansovino the frieze; while Formentone, a local architect, designed the building. It was built in 1508 on the ruins of a temple of Vulcan.

THE CHURCH OF ST. FRANCIS, ASSISI, ITALY.

THE view shows the entrances to the two churches enclosed in one building, the lower built in 1228–32, and the upper in 1253.

ST. ALBAN'S ABBEY AS RESTORED BY SIR E. BECKETT.

THIS illustration, published a short time ago in the *Building News*, makes more intelligible the article published elsewhere in this issue.

SKETCHES AT ALBANY, N. Y.

STUDY FOR A CITY HOUSE. MR. H. P. KIRBY, ARCHITECT, ALLEGHENY, PA.

PROPOSED LAW FOR THE ERECTION OF PUBLIC BUILDINGS.

AS REPORTED BY A COMMITTEE OF THE AMERICAN INSTITUTE OF ARCHITECTS.



NEW YORK, July 11, 1885.

TO THE BOARD OF TRUSTEES, A. I. A.:—

In the second session of the Forty-Eighth Congress, which came to an end on the 4th day of March, 1885, a long step was taken in advance of any previous Congress, on the subject which has been for so many years in the minds and exemplified in the acts of members of the Institute, namely, the formation of a law which shall place this nation abreast of other and older nations in their wise provisions for the erection of public buildings.[1] Of the three bills introduced for this purpose by two different members, and referred to the Committee on Public Buildings and Grounds, one known as the Stockslager Bill, having been introduced by the Hon. S. M. Stockslager, of Indiana, was so fortunate as to receive the close attention of that Committee, and was by them altered and amended in many very important particulars, taking away a great deal of its crudity, and adding many important provisions, which, had the bill passed, would have made it a consistent and practicable law.

This bill had, incorporated among its various features, one, for which the Institute has so long contended, and which it deems so very important both to the Government and to the profession,—a statute requirement that the design for every building costing more than fifty thousand dollars should be obtained by public competition among the architects of the country. This feature, so ardently recommended to the Government by our Board in 1874, in its communication to the Secretary of the Treasury by invitation of that officer, has been at last embodied in a Bill before Congress, and reported on favorably by the Committee having it in charge. And although the bill was never put upon its passage, on account of the greater prominence of many less important bills, it has yet become a matter of record on the rolls of the House, as a reported bill, referred to the Committee of the whole House, and ordered to be printed with all the emendations of the Committee that reported it.

This bill being by far the most complete of the three sent to the Committee, and having had the consideration of the Committee in regard to many provisions necessary to harmonize it with the present laws and traditions of the Government, may now be used as a basis upon which a still more perfect bill may be constructed, and again made use of to be introduced to the attention of the next Congress for their considerate action. But the bill as originally drawn, and even after undergoing the scrutiny and criticism of the Committee, retained many provisions which were very far from meeting the plainly expressed views of our Board. Our claim was that the successful architect designing the building, should also have the sole care of its construction; but the labors of the Committee did not go so far as to provide this; the architect was to produce his plans, specifications and working-drawings, and deposit them in the office at Washington City, receive his pay for them, and then go about his business. The functionaries of the central office were to construct

[1] See proceedings of Ninth Annual Convention, A.I.A., held in Baltimore in 1875, page 27. A "Bill for a Proposed Bureau of Architecture" was discussed during the greater part of the second day of the Convention, and adopted. A committee was appointed to press it upon the attention of the Department and Congress. The Bill, as prepared by a Committee and Mr. Smithmeyer of Washington, was printed and distributed at the Convention. Preliminary to the opening of the discussion of the subject, Mr. Smithmeyer and Mr. Wight read two excellent Papers—the former on American Architecture, and the latter on Government Architecture and Government Architects. These were published in the *American Architect* of Boston. Mr. Wight's Paper gives an exhaustive history of the whole subject.

the building. This feature left the Bill in a very incomplete state,[1] and lessens the regret that we might otherwise feel at its not being put upon its passage; it should now be expunged from the new bill in its reconstruction from the old, which will thus work very much to its advantage; and this, we hope, may then meet the approval of a future committee.

A fundamental provision of the Stockslager Bill, is the creation of a Board, having full administrative control of the erection of all public buildings, as well as a supervisory control of the workings of the Office having charge of said buildings in the Treasury Department. This Board is to consist of the Secretary of the Treasury, the Postmaster-General, the Attorney-General, the Chief Engineer of the Army, the Supervising Architect of the Treasury Department, the Architect of the Capitol, and one architect appointed by the President, "who shall be of good standing," etc. This Board is to administer all the affairs of the Department, relating to the purchase of sites, the laying out of grounds, and the erection of buildings; and it not only is to do this—which is an excellent measure in itself considered—but it is to pass upon the plans sent in competition, and to select the design for the building. As an administrative body, formed for the making of contracts and administering the law, no objection can be made to this Board—even without the last-named member, as selected by the President, but it is no disparagement to any one of the non-professional members composing it, to say that they are not of such training as would fit them to become members of an art commission to select the best architectural design for a public building. The wisdom of their decision would be called in question by the architects competing, and would generate a dissatisfaction that would discourage the best class of architects from offering designs. Said Board should be retained to fulfil their natural function, but a Commission of professional experts should be called in each case to select the design of the building — advisory though it may be, and subject to the approval of the said administrative board.

Further, the Supervising Architect of the Treasury by being restricted by this Bill to the designing and erection of buildings costing less than fifty thousand dollars, together with the clerical duty connected with recording the action of the administrative board, in making contracts for work and materials upon all the buildings erected by the Government and consigned by law to the administration of the Treasury Department, his function becomes less that of an architect, solely, and merges into that of a commissioner; his title therefore should be Commissioner of Architecture, and his office should be designated as the Bureau of Architecture in the Treasury Department. Although to make this change the customs and traditions of the Department may slightly be trenched upon, no hesitation should be evinced on that account, as the new order of things brought into existence by the new law should be properly inaugurated by a change of nomenclature as well.

The annexed draught of a new bill[2] has been prepared in accordance with the views above expressed, and is respectfully submitted to the action of the Board. O. P. Hatfield,
Committee.

A Bill to establish the Office of Commissioner of Architecture, and a Board of Public Buidlings; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled: —

Section 1. That from and after the passage of this Act, the Supervising Architect of the Treasury Department shall be known and designated as the Commissioner of Architecture, and his Bureau is hereby established and confirmed as the Bureau of Architecture in the Treasury Department.

Sect. 2. That the Secretary of the Treasury, the Postmaster-General, the Attorney-General, the Chief Engineer of the Army, and the Commissioner of Architecture shall constitute a Board, which shall be known as the Board of Public Buildings, and of which the first and last-named shall be the President and Secretary respectively. Said Board shall have the administrative control of the erection, extension and repair of all buildings, whose construction and care are or shall be by law assigned to the Treasury Department. The Board, a majority of whom shall constitute a quorum, shall have their first meeting in Washington City on the first Monday of April, eighteen hundred and eighty-six; they shall consider such business as may be brought before them, and adjourn to meet from time to time at the call of their President.

Sect. 3. That the said Commissioner of Architecture shall have general charge, under the direction of said Board, of the erection of all of said new Public Buildings and of the alteration, extension and repair of all of said present buildings, to the extent authorized by law. He shall also have charge, under said direction, of the regulation and ornamentation of the grounds thereof and approaches thereto, and of the equipment of said buildings with all necessary fixtures and furnishings, including heating, ventilating, lighting, plumbing and annunciatory appliances.

Sect. 4. That said Commissioner of Architecture shall be appointed by the President on the nomination of the Secretary of the Treasury, and by and with the advice and consent of the Senate. He shall have been a professional architect in good standing for a period of at least ten years preceding the date of his appointment, and shall have had an extensive experience in the erection of important buildings. He shall hold his office for the term of four years, unless sooner removed by the President; and he shall have a salary of six thousand dollars per annum and his actual expenses when travelling on the business of his office.

Sect. 5. That there shall be, in said Bureau, a Deputy-Commissioner of Architecture, who shall receive an annual salary of four thousand dollars, and who shall act as the Deputy of said Commissioner, and perform such other duties as the Commissioner of Architecture may direct. There shall be, also, in said Bureau, the following clerks and employés: — one principal clerk at an annual salary of two thousand dollars; a photographer at two thousand dollars; two clerks of class three; three clerks of class one; one clerk at nine hundred dollars; one messenger at seven hundred and twenty dollars; and as many draughtsmen and copyists as are necessary for the work of the Bureau, and whose rate of compensation shall be fixed by said Board. Said Deputy-Commissioner of Architecture, clerks and employés, shall be appointed by the Secretary of the Treasury on the nomination of the Commissioner of Architecture.

Sect. 6. That the Commissioner of Architecture, with the assistance of said Deputy-Commissioner, clerks and employés, shall execute all duties pertaining to the designing, drawing of plans, preparing specifications, working and detail drawings, estimating and computing, making out of contracts, supervising, etc., for all of said new buildings, and additions to present buildings, which shall cost less than fifty thousand dollars, and for all alterations and repairs of said present buildings.

Sect. 7. That every new building costing fifty thousand dollars or more, and every addition to a building already erected of like extent of cost, shall, for the purposes of this act, be regarded as a special building, for which the Commissioner of Architecture shall appoint, in the manner hereinafter provided, a special architect, to have, under said Commissioner, the full control thereof; and who shall, by the services of himself and his assistants employed in his own private office, execute for said building all the duties enumerated in the preceding section as pertaining to the erection of buildings of less cost than said sum: —

Provided, that all proposals for furnishing the labor and materials for said special building shall be received, and all contracts therefor, and all payments thereon, shall, under the direction of said Board, be made by the Commissioner of Architecture at his office in Washington City. The designated payments in said contracts shall be made only upon the presentation of the certificate of the Special Architect, certifying to the completion of the work in its several stages respectively.

Sect. 8. That the said Special Architect shall receive as compensation for his design, selected as hereinafter provided, and for the performance of all of said services of himself and his office-assistants, a commission of five per centum on the cost of the building, when the cost thereof is one hundred thousand dollars or less; and said commission shall be one-tenth of one per centum less, when said cost exceeds one hundred thousand dollars but does not exceed two hundred thousand dollars; and a like diminution of said commission shall occur at every like increase of one hundred thousand dollars in cost until a rate of commission of two-and-a-half per centum is reached, when no further decrease in said rate of commission shall take place. Payment of said compensation shall be made by the Commissioner of Architecture, under the direction of said Board, as follows: — one-third when the contract-plans and specifications are delivered, and the remaining two-thirds in six equal instalments at equal stages in the progress of the erection of the building; said payments shall be based on the computations of the said cost made by the Commissioner of Architecture, and the last two instalments so adjusted as to make the whole commission correspond with the actual cost.

Sect. 9. That the Commissioner of Architecture shall appoint, on the nomination of the said Special Architect, and under the direction of said Board, a Clerk-of-the-Works, or Superintendent, for said special building, whose duty it shall be to give a constant superintendence of the work, to take charge of all drawings and papers relating thereto and remaining at the building and to carry out the instructions of the Special Architect. Said Clerk-of-the-Works, or Superintendent, must be an expert in drawing and in the various processes of building, and well instructed in a knowledge of the qualities of materials and workmanship; he shall see that the building he has charge of shall be erected according to the plans and specifications furnished by the Special Architect, that the material is such as the contractors have agreed to supply, and that the workmanship is the very best. He shall receive as compensation for said services six dollars per diem, payable from the sum appropriated for the erection of the building; and shall give bond in such sum and with such sureties as the Secretary of the Treasury shall approve. And where the works are extensive, the Special Architect shall, by consent of the Commissioner of Architecture, given in writing, appoint as the assistant of said superintendent, a clerk at four dollars per diem, also payable from said fund. A like superintendent, having like duties to perform, and given like compensation, shall also be appointed by the Commissioner of Architecture for buildings and additions costing less than fifty thousand dollars; where practicable a superintendent shall have the care of more than one such building without additional compensation.

Sect. 10. That the design or plan, and the Special Architect, of every such special building shall, under the approval of said Board, be selected and determined by a Commission, in the manner provided in the next succeeding section. Said Commission shall be composed of the Secretary of the Treasury, the Commissioner of Architecture, and four experts selected and appointed by the Secretary of the Treasury, under the direction of said Board, from the architects most eminent in their profession in this country. A separate Commission thus constituted shall be convened for every such building or group of buildings, and when their action in regard to the choice of a plan and a Special Architect therefor shall have been consummated, their existence as a commission shall terminate: — *Provided*, that should an exigency arise, in regard to the building upon which they have acted, requiring further action in respect to a modification of said plans, or the substitution of a different plan or design, and the appointment of its author as Special Architect, said Commission shall be re-convened by its chairman, and

[1] The reason of this is evident—an architect's design can only be properly carried out, and its structural characteristics justly maintained in all its details by the author of the original conception. The architect, therefore, who designs the building should superintend its erection. This cannot be too thoroughly impressed upon those who exercise the prerogatives of government.

[2] For the Bill presented by Hon. S. M. Stockslager, see the *American Architect* for December 20, 1884.

hold its sessions until said action shall have been brought to a successful issue. The Secretary of the Treasury shall act as the Chairman of said Commission, and the Commissioner of Architecture as the Secretary thereof; and a majority of its members shall constitute a quorum. Each of the said expert Commissioners shall receive, as compensation for his services, twenty-five dollars per diem, and his actual travelling expenses while engaged upon the duties of the commission.

SECT. 11. That the Special Architect for every building regarded as a special building, as hereinbefore provided, shall be selected from the architects of the United States by a public competition, in regard to the merit of the designs and plans which may be severally offered by them for said building, as decided by the Commission provided in the preceding Section, and approved by said Board. After the expert members of said Commission shall have been appointed, and shall have signified their acceptance of the position in writing, the Commission shall meet and prepare a circular defining the terms and conditions of the competition. Said circular shall be sent by mail to the several architects of the Union in accordance with the published list of addresses thereof; and also be advertised for three weeks in three daily newspapers of largest circulation in each of the principal cities of the Union, and in three of the most prominent architectural journals thereof; the advertisements shall be in the form of a notice to architects stating where the circular may be procured. The terms and conditions of the competition, as set forth in the circular, shall include a statement of the several requirements of the proposed building in regard to the number and general dimensions of the rooms, halls and apartments, necessary for the accommodation of the officers, clerks and the public, who will resort to or occupy the same, and all other information that will contribute to give to the competitors a proper comprehension of the uses to which the building will be applied, together with the peculiarities of the site.

SECT. 12. That said circular shall also describe the number, character and style of the drawings required, as to the scale thereof, the coloring, and to what extent they shall be in perspective; and shall require from competitors a full written description of their plans, and an estimate of the cost of the building if erected in accordance therewith. The circular shall also state the limit of cost fixed by law for the erection of said building, with the statement that no plan will be considered the cost of the execution of which will not come within said limit; it shall determine the time (which must be ample) within which said competitive plans will be received. Each competitor will be required to mark his plans with a private device or motto, which shall be of a nature to conceal his authorship thereof, and the same device or motto shall be marked upon the outside of a sealed envelope containing his name and address, and sent with the plans; no plans shall be considered whose author has revealed his name in connection therewith. All plans must be sent by mail to the Commissioner of Architecture, who shall lay them unopened before said Commission.

SECT. 13. The said circular shall also include a list of the prizes, which shall be five in number; the first prize shall be given for the accepted design, and shall consist of the appointment of its author as Special Architect to carry out the work; the remaining four prizes shall consist of sums of money given to the authors of those designs which shall be decided to be second, third, fourth and fifth, in order of merit respectively. Said Commission shall fix the amounts of the money prizes, which shall be reasonable and correspond with the importance of the building.

SECT. 14. That said Commission shall, at a meeting convened at the call of the Chairman thereof, consider the plans which are properly before them in pursuance of their advertisement, and shall award, subject to the approval of said Board, the said prizes in accordance with the merit of the respective designs; the design which seems to be best suited for the building to be erected shall be adopted if found worthy, the Commission having first ascertained that the plan proposed can be executed within the limit fixed by law. Should the Commission conclude that no design had been submitted which was worthy of being adopted, the money prizes only shall be awarded for the four best designs, and another like competition for a design for the building shall be instituted by said Commission. The rejected plans shall be returned to their authors at the expense of the government. No member of said Commission, nor any officer or employé of the government, shall offer a design or plan in said competition, or be in anywise personally interested in any design offered by a competitor. Should a plan be adopted by said Commission, and accepted for the building by said Board, the author thereof shall be appointed, as hereinbefore provided, the Special Architect for the erection of the building; a time shall be fixed for the reception of his contract plans and specifications, and the sessions of said Commission shall thereupon terminate.

SECT .15. That the said Special Architect shall give bond in such sum as may be required by the Secretary of the Treasury, conditioned that he shall prepare proper contract-plans and specifications of said building in duplicate (one set of which shall be filed in the Bureau of Architecture and the other in his own office) within a reasonable time (which must be fixed as above provided by said Commission before the termination of their session), and in proper form to receive the signatures of contractors. As fast as the working detail-drawings are prepared, copies of these also shall be furnished by the Special Architect and filed in the Bureau of Architecture. If the Special Architect shall fail to furnish to the Commissioner of Architecture the contract-plans and specifications within the time appointed, he shall be cited before said Board, who shall hear his defence as to the causes of the delay; if these shall be deemed insufficient he shall be adjudged to forfeit a just penalty to the government proportioned to the loss suffered by his default; and an extension of time shall be granted to a second date fixed by said Board, for the production of said plans, under a like penalty.

SECT. 16. That when a plan for the erection of any special building has been selected, the work shall be carried on as hereinbefore provided: and no changes, alterations, omission or additions to the accepted plans shall be made or permitted, except by the authority of the said Board, which shall only order such changes after the designer of said plans has had an opportunity to be heard upon such proposed changes, alterations, omissions or additions; and should any such change of plans be very extensive, and materially affect the design of the building, the said Commission that originally adopted said plans shall be re-convened, consider said change, and make a report upon the same to said Board, who shall only thereupon make their decision. But no change shall be made until the cost of making the same shall have been ascertained; and if it shall affect any contract, the increased or diminished cost, if any, shall be agreed upon by the contractor and the Commissioner of Architecture before such change is ordered: *Provided*, that in no case shall the cost of the change increase the cost of the building beyond the limit fixed by law. The Special Architect designing the plans of said building and supervising its erection shall, whenever requested by the Commissioner of Architecture or said Board, report if the plans and specifications are being complied with in its erection, and if the material and workmanship are in accordance with what they were required to be. Such reports shall be filed with the Commissioner of Architecture, who, in case they show that the work is not being done according to the plans and specifications, or that the material or workmanship is not according to contract, shall investigate the matters complained of, and, if the statements are found to be true, shall take such measures as are necessary to have the defective portions of the work remedied, and to prevent departures from the plans and specifications in the future. The furnishing of said reports shall be deemed to be one of the duties of the said Special Architect.

SECT. 17. That the Commissioner of Architecture shall report annually to the Secretary of the Treasury all the work of his office up to and including September 30; and he shall give a list of all buildings under his charge, including said special buildings, the amount expended upon each during the year and the total amount of such expenditures, the cost of each building, the cost of the site, the cost of the superintendence of each building, the cost of repairs on each building for the preceding year, and the total cost of site, building and repairs, the names of all persons employed by him in the erection or repair of public buildings, including those of the Special Architects thereof, the amount paid each during the year, the rate of salary or commission paid, and the time each was employed. He shall also report the names of places from which applications have been made for the erection of public buildings, the probable cost of a public building at each of said places, including site, grading, fencing and furnishing, together with the amount paid for rent at said places, the present accommodations for the public offices, the number of persons employed in the public service, the amount of the public revenues and the sources from which they are derived, the expenses of collecting the same, the population and rate of increase of same during the previous ten years, and such other information as may be a guide to Congress in determining if a public building may be erected at any of said places; and, at any time when called on by a committee of either House of Congress, he shall make report of the income which the government derives from customs duties, internal revenue taxes or post-offices, and the amount of business done in the United States Courts, in any locality where the erection of a public building is contemplated, which said report shall cover a period of ten years last past, and shall also state the accessibility of suitable building materials and facilities for transportation to said point.

SECT. 18. That said Board shall discharge all administrative duties relating to the selection of sites and making of contracts for the construction, heating, lighting, plumbing and furnishing of all public buildings not otherwise provided by law. Said Board shall not construct any building unless the site shall leave the building unexposed to dangers from fire in adjacent buildings by an open space of not less than forty feet, including streets and alleys; and no money appropriated for any building shall be expended until a valid title to the site for said building shall be vested in the United States, nor until the State in which such building may be situated shall have ceded to the United States exclusive jurisdiction over the same, during the time the United States shall be or remain the owner thereof, for all purposes except the administration of the criminal laws of said State and the service of civil process therein.

SECT. 19. That any one feeling aggrieved at the decision of the Commissioner of Architecture may appeal to the said Board, whose decision shall be final.

SECT. 20. That whenever the contract-plans and specifications shall be prepared or approved for the erection of any proposed building or extension or repair of a building already erected, for the United States, it shall be the duty of the Commissioner of Architecture to advertise once a week, for at least six weeks, in one or more of the principal journals published in the place where such building is to be erected, and in such other journals as he may select, including at least three daily journals in each of the principal cities of the Union, for sealed proposals for the work and materials necessary in the erection, heating, plumbing, lighting and furnishing of said building. Said advertisement shall provide for separate bids for the different kinds of work and materials, as well as for gross bids for the entire structure, and shall refer bidders to the office of the Commissioner of Architecture for copies of the plans and specifications for said work and materials. All such proposals shall be kept sealed until the day specified in such advertisement for opening the same, when they shall be opened by or under the direction of the said Board. The person offering to do the work or furnish the materials described in the advertisement for the lowest sum bid, and giving satisfactory security for the performance of the contract, under a forfeiture to be fixed by said Board, at least fifty per centum above the contract price, shall be awarded the contract for the work and materials so advertised. *Provided*, That the said Board may reject any bids which they may deem excessive, or which they may for other cause deem contrary to the best interest of the Government; *And also provided*, That the said Board may have the foundation or roof, or either, of any public building, laid by days' work if they think it is for the best interest of the Government.

SECT. 21. That every advertisement under the preceding section shall specify a reasonable time within which the work or materials herein mentioned shall be done or furnished; and every proposal for work or materials as hereinbefore provided shall be accompanied by a

written undertaking or guaranty, signed by one or more responsible persons, to the effect that he or they undertake that the bidder, if his bid be accepted, will at such time as may be prescribed by the said Board, give bond, with good and sufficient sureties, said bond to be approved by said Board, to do said work or furnish said materials according to the plans and specifications furnished and within the time named in the said advertisement. No proposal shall be considered unless accompanied by such guaranty. If, after the acceptance of a proposal and a notification in writing to the bidder of its acceptance, he fail to give bond within the time prescribed by the said Board, the Commissioner of Architecture shall proceed to re-advertise for proposals for said work or materials as hereinbefore provided; and after contracting with some other person as set forth in this and in the preceding section, the Secretary of the Treasury shall forthwith cause the excess, if any, of the amount contracted to be paid by the Government over and above the amount of the first bid to be charged up against the first bidder and his guarantor or guarantors; and the same may be recovered by the United States, for the use of the fund appropriated for the erection of said building, by action of debt against either or all of such persons.

Sect. 22. That when any proposal for work and materials shall be accepted by the said Board, as hereinbefore provided, the person making such proposal shall, within a time to be prescribed by the said Board, execute a bond with two or more solvent sureties, in a sum at least fifty per centum above the amount of the contract price, conditioned that the work and materials shall be as required by the plans and specifications furnished, and that the said building shall be completed within the time named in the advertisement. Before approving and accepting said bond the Secretary of the Treasury shall be satisfied that the sureties thereon are unquestionably solvent, and the owners in fee of unencumbered real estate to the value of the amount named in the bond as a penalty. In the event of a failure to furnish the work and materials according to the requirements of the bond, the principal and sureties therein shall be liable for the penalty of said bond as liquidated damages, to be sued for in the name of the United States.

Sect. 23. That all proposals provided for in this Act shall be preserved in the office of the Commissioner of Architecture; and the Commissioner of Architecture, in his annual report, shall give the amount of each bid and the persons naming the same, and shall state what bids have been accepted.

Sect. 24. That all repairs or improvements upon any public building amounting in cost, according to the estimates, to more than five thousand dollars, shall be subject to the provisions of this act, and the same procedings shall be had with reference thereto as are herein required for the erection of an entire building.

Sect. 25. That the members of the Board provided for in this act who shall approve of any plan before it has been ascertained that the cost of the execution of said plan will not exceed the limit of cost fixed by law, and any competing architect who shall designedly prepare a plan for a public building knowing that the cost of executing said plan will be greater than the limit of cost of said building fixed by law, and any computer employed by said Board who shall falsely estimate the cost of executing any plan so as to make it appear to said Board that such cost will be less than the computations make it to be, so that the cost of said building will be greater than the limit fixed by law, shall, on conviction thereof before any court of the United States in whose jurisdiction the said building is located, or in the District of Columbia, where said plan was approved or the false computation made, be fined in any sum not less than five hundred dollars, to which imprisonment not exceeding one year may be added, in the discretion of the court. Any person so offending may be indicted within two years after said building is completed. And it shall be the duty of the Commissioner of Architecture to cause all offenders against this Act to be reported to the Department of Justice as soon as the offence is discovered, that the parties so offending may be prosecuted.

Sect. 26. That any deputy commissioner, superintendent, clerk, inspector, or other employé of the Bureau of Architecture, who shall neglect the performance of any duty assigned him by the Commissioner of Architecture by which the cost of the erection of the building upon which he is employed shall be increased, or who shall receive any material inferior to or different from that called for by the plans and specifications, or who shall permit the plans or specifications of the building to be departed from, except as provided for in this act, shall, on conviction thereof, be fined in any sum not less than five hundred dollars.

Sect. 27. That any contractor who shall construct the building on which he is engaged in a different way from that prescribed by the plans and specifications, or who shall supply different or inferior material from that called for in the specifications, or who shall cause the work to be done in a manner different from that called for in the specifications or in his contract, except as provided for in this act, shall, on conviction of such offence, be fined in any sum not less than five hundred dollars.

Sect. 28. That the Commissioner of Architecture shall be held responsible for the proper enforcement of this act, and if he shall neglect any duties which he is required by law to perform, or if he shall permit the limit of cost of any public building to be exceeded, or if he shall permit any contract for the erection or repair of any public building to be violated by supplying inferior or different material, or by permitting the work to be done poorly or different from that called for in the plans and specifications, or by changing said building from the plans and specifications accepted by the Board, except as in this act provided, or if he cause any work to be done on any public building contrary to any of the provisions of this act, he shall, on conviction thereof, be fined in any sum not less than five hundred dollars, to which imprisonment for not more than one year may be added, in the discretion of the court.

Special Meeting of Board of Trustees.

New York, August 5, 1885.

The above Report of the Special Committee on a Proposed Law for the Erection of Public Buildings and Draught of said Law, were adopted, as amended, and ordered to be printed.

Henry M. Congdon.
Secretary, pro-tem., A. I. A.

NOTES AND CLIPPINGS.

"A Statue of Huguenot."—"I wonder," says London *Truth*, "how many ordinary individuals are acquainted with the origin of the term Huguenots? At Cape Town last month a great meeting of their descendants was held, with a view of discussing the best means of celebrating the bicentenary of the landing of the Huguenots in Cape Colony. Very few people in the room, however, knew what Huguenot really meant, and one gentleman proposed that the memorial should be 'a statue of Huguenot, with extracts from his works inscribed round the base.'"

Some Comical but Costly Blunders. — Mistakes are expensive sometimes. A New Yorker had a lot seventy-five feet wide, intending to build four houses of equal fronts on it, and one of the middle ones first. He employed a firm of surveyors to locate the house, and they located it so that the remaining space on one side was only ten feet wide. The error was not discovered until the house was done, the proprietor having no time, probably, for such trifles. Then he sued the surveyors for damages, but they won a verdict on the ground that their plan was accepted and paid for as satisfactory, although it located the corner-stone nine feet farther in one direction than was intended. This mistake was rather more serious than that played upon a resident in a brown-stone front in Forty-seventh Street, who returned from business one night to find the entire stoop of his house in ruins, the heavy stonework having been pulled to the ground. His wife said a man had come with orders to demolish, and had done so. Although she did not know enough to command a halt for explanations, she did observe the name on the wagons. The indignant citizen took measures to prosecute, when it was found that the employer of the men had ordered them to go to the same number in Forty-eighth Street, instead of to Forty-seventh. He had learned of the mistake and had contracted to have the wrong stoop rebuilt, and he was surprised to learn that the work had not been done. These incidents of metropolitan life show that mistakes are there regarded with very little concern, those responsible not even taking the trouble to apologize or even explain. The same amount of pains spent in doing a job well that is spent in getting the job to do would pay.—*Springfield Republican.*

The Severn Tunnel Completed.—Overcoming what at one time seemed almost overwhelming difficulties the Great Western Railway Company and the engineers, Sir John Hawkshaw and Mr. Richardson, associated with Mr. Walker, the contractor, have at length completed the prodigious work of driving four miles and a quarter of tunnel beneath the mouth of the Severn, and have thus connected South Wales directly with the Great Western Railway Company's system on the Gloucestershire side of the river. They have by this means reduced the distance from London to Cardiff by thirteen miles, and the time occupied in going from Bristol to Cardiff to one and a quarter hours. On Saturday, Sir Daniel Gooch and the staff of the works, with several ladies, including Lady Gooch, the whole numbering forty passengers, were conveyed through the tunnel from end to end in a train of saloon carriages. They took half an hour going through to Pitning, where the tunnel comes out on the English side of the Severn, and eighteen minutes in the return journey to Rogglett Station on the Monmouthshire side. The ordinary time to be occupied in passing through the tunnel is estimated at only ten minutes. The party, both ladies and gentlemen, thoroughly enjoyed the trip, and found the atmosphere in the tunnel clear and the ventilation admirable. The tunnel is twenty-six feet wide, twenty feet high from the rails to the crown of the arch inside the brickwork, and has a double line of rails laid on longitudinal sleepers. More than a mile of it has been excavated through the hard pennant sandstone and the coal measures; half a mile through conglomerate overlying the pennant; half a mile in the shale of the coal measures, with some beds of coal twelve inches thick, and the rest was through the red marl of the new red sandstone. About four-and-a-quarter miles of actual tunnelling are beneath the bed of the river, and in the journey on Saturday the whole of this was found as perfectly dry as the floor of a room, the only sign of water from leakage from the once troublesome land springs being on the Monmouthshire side near what is known as the Five-mile Four Chain Shaft, where the great spring was tapped in 1883, when this part of the works was flooded. The leakage, however, was very slight, and it will be easily stopped by calking and cement work similar in character to the plan adopted beneath the river. The "cover" or depth of strata between the river bed and the crown of the tunnel has a minimum of fifty feet. At this point there is always fifty-five feet of water over the tunnel even at low tide, while at high tide this is increased to no less than ninety-one feet. Seventy five millions of bricks have been used in lining the tunnel throughout with Staffordshire or vitrified brick set in cement. This arched crown or wall has a thickness of three feet in the deepest part of the work beneath the "shoots," but as the tunnel rises from the lowest point this thickness is gradually reduced to two feet three inches; 700,000 cubic yards of material have been excavated, chiefly through rock, and from commencement to finish the work has in all been spread over a period of twelve years, but the present contractor has been in possession of the work only five-and-a half years. A powerful fan forty feet in diameter, had to be erected to complete the ventilation, and some cutting on the Gloucestershire side, together with the junction with the main lines and the doubling of portions of the line from Patchway, have to be finished before the tunnel will be opened for traffic, probably in two or three months.—*London Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

327,989. STONE LIFTING AND CARRYING MACHINE. —William E. Barber, Wyoming, R. I.

327,997. ELECTRIC ANNUNCIATOR. — Arthur E. Briggs, Bond Hill, O.

328,030. ELECTRIC BOLT-RELEASING DEVICE. — Geo. L. Henzel, San Francisco, Cal.

328,031. BEAM-COMPASSES. — Lester E. Hickock, Birmingham, Conn.

328,064. WINDOW-SCREEN. — Paul Ramser, Montezuma, Iowa.

328,073. COMPOSITION FOR GRAINING WOOD. — Adam Smith, Middleville, Mich., and Polly A. Zelle, Dundee, N. Y.

328,077. COMBINED DOOR SPRING AND CHECK.— John S. Stevens and Charles G. Major, Battersea, County of Surrey, England.

328,080. WINDOW-SCREEN FRAME.—John E. Stewart, Newark, N. Y.

328,081. CRANE.—John Sutherland, Attica, Ind.

328,102. PIPE-VISE. — John C. Bauer, Brockley, County of Kent, England.

328,114. DOOR-OPERATING DEVICE.—Julius Finck, San Francisco, Cal.

328,141. SHUTTER-WORKER. — Edwin Prescott, Arlington, Mass.

328,167. PIPE-WRENCH. — Richard E. Williams, Modesto, Cal.

328,168. MEANS FOR VENTILATING SEWERS.—John S. Wilson and William W. Green, Chicago, Ill.

328,180. WATER-CLOSET. — Philip Brady, New York, N. Y.

328,182. WINDOW-VENTILATOR.—John G. Bronson, Chicago, Ill.

328,184. KNOB-ATTACHMENT.—Philip Burns, Norwich, Conn.

328,185. FLOOR AND CEILING. — Charles Butcher, Boston, Mass.

328,191. KNOB-ATTACHMENT. — William H. Comstock, Norwich, Conn.

328,192. DOOR-CHECK.—Joseph A. Coultaus, Brooklyn, N. Y.

328,195. ROCK-DRILL. — George R. Cullingworth, New York, N. Y.

328,196. ROCK-DRILLING MACHINE. — George R. Cullingworth, New York, N. Y.

328,225. BURGLAR-ALARM. — Thomas James, Jr., Carlyle, Ill.

328,250. FIRE-EXTINGUISHING COMPOUND. — William H. Polleys, Melrose, Wis.

328,265. WINDOW-SCREEN. — Marcellus L. Whitcomb, Coldwater, Mich.

328,270. PIPE WRENCH AND CUTTER. — John Williamson, Camden, N. J.

328,286. WOVEN TAPE-LADDER FOR VENETIAN-BLINDS.—James Carr, Manchester, County of Lancaster, England.

328,294. ELEVATOR.—Henry M. Darling and Robert F. Darling, Linwood, O.

328,311. ELEVATOR. — Edward M. Ingoldsby, New York, N. Y.

328,320. COUNTERSINK.—Frederick Leu, Brooklyn, N. Y.

328,324. SASH-BALANCE.—Joseph Loch, New York, N. Y.

328,333. FILTER.—Emil Noppel, Philadelphia, Pa.

328,342. FIRE-SCREEN HINGE. — Jas. M. B. Robinson, New York, N. Y.

328,345. FIRE-ESCAPE.—Louis Sees, Port Elgin, Ontario, Can.

328,347. SASH-BALANCE.—Newton J. Skaggs, Montgomery, Ala.

328,350. SELF-ADJUSTING CHAIN SLING.—William Smith, Brooklyn, N. Y.

328,354. WASH-BASIN OR SIMILAR VESSEL.—Emily A. Stears, Brooklyn, N. Y.

328,361-362. SELF-CLOSING HATCHWAY. — Richard D. Thackston, St. Louis, Mo.

328,382. DOOR-HANGER. —Norman Clark, Sterling, Ill.

328,393. COMBINED LATCH AND LOCK. — Samuel Ehrman, Connellsville, Pa.

328,426. PAINT-BRUSH. — Wm. A. Nowlin, Mexia, Tex.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report thirty-four permits have been granted, the more important of which are the following: —

Chas. Shipley, 4 two-st'y brick buildings, e s Calhoun St., commencing n e cor. McHenry St., and 9 two-st'y brick buildings, n s McHenry St., e of Calhoun St.

J. W. Hoffacker, 16 two-st'y brick buildings, w s Scott St., s of Cross St., and 12 two-st'y brick buildings, e s Wicomico St., s of Cross St.

Edw. Booth, three-st'y brick building, n s Tyson St., between Tyson Alley and Park Ave.

W. B. Turner & Son, 5 two-st'y brick buildings, w s of Fortieth St., e of Riverside St., between Fort Ave. and Clement St.

Griffith & Turner, four-st'y brick building, e s Paca St., between Saratoga and Lexington Sts.

W. H. Hickman, three-st'y brick stable, n s Tenth Alley in rear w s Mott St., between Gay and Ensor Sts.

M. Wurtzberger, 2 three-st'y brick buildings, w s Harford Ave., n of Hoffman St.

Jas. Thurston, 6 two-st'y brick buildings, s s Presbury St., w of Gilmor St.

Chas. Gantz, 8 three-st'y brick buildings, e s of Broadway, s of Preston St.

Wm. Collett, 6 three-st'y brick buildings (square), w s Bolton St., n of Laurens St.

A. Weiskittel, three-st'y brick building, e s Washington St., between Fountain and Allceanna Sts.

H. Schildwachter, 2 two-st'y brick buildings, w s Pennsylvania Ave., n of Baker St.

L. L. McCusker, 3 two-st'y brick buildings, e s Argyle Ave., between Pitcher St. and the Market.

Wm. Hevser, 2 three-st'y brick buildings, w s Hillman St., s of Eager St.

Samuel Black, 2 three-st'y brick buildings, s e cor. Maryland Ave. and Townsend St.

F. W. Maldeis, 4 three-st'y brick buildings, commencing n w cor. Lexington St. and Selma Pl., and 5 two-st'y brick buildings, w s Selma Pl., n of Lexington St.

Jas. W. Lindall, 7 three-st'y brick buildings, w s McKim St., commencing s w cor. Biddle St.

Chas. W. Shipley & Co., 6 two-st'y brick buildings, w s Stockton Alley, s of Lanvale St.

Boston.

BUILDING PERMITS. — *South St.*, near Ashland St., storage, 25′ x 30′; owner, Granville S. Seavens; builder, W. S. Mitchell.

Dorchester Ave., cor. Brook St., dwell., 20′ and 27′ x 31′; owner, Fitz Henry Price; builder, P. Fleming.

Lincoln St., *No.* 33, storage, 25′ x 40′; owner, Thos. B. Merrill; builder, Angus McGinness.

Unnamed St., near Newhall St., dwell., 13′ x 21′; owner, Thomas Sullivan; builder, H. P. Oakman.

Gold St., *No.* 94, dwell., 18′ x 40′; owner, Margaret Kiley; builder, Wm. A. Pentry.

Richfield St., near Olney St., dwell., 29′ x 31′; owner and builder, A. J. McLaren.

Wyman St., near Centre St., dwell., 17′ and 23′ x 45′; owner and builder, Andrew Cassidy.

Gold St., *No.* 92, dwell., 18′ x 40′; owner, Margaret Kiley; builder, Wm. Pentry.

Dennis St., near Stafford St., dwell., 30′ x 38′; owner, Hiram Nash; builder, W. M. Henderson.

Paul St., cor. Gove St. and Chestnut Ave., dwell., 33′ x 40′; owner, John G. Cabe; builder, Thomas Clune.

A St., *No.* 136, storage, 27′ x 30′; owner, James Quinn, owner; M. F. Sullivan, builder.

Dorchester Ave., near Ashmont St., station, 7′ x 35′; owner, Old Colony R. R. Co.; builder, Edward Russell.

Maverick Sq., *No.* 43, storage, 15′ x 15′; owner, G. L. Thorndike; builder, J. J. Fowler.

East Fourth St., *Nos.* 476 *and* 478, dwell., 29′ 6″ x 74′; owner and builder, Lyman Locke.

East Third St., dwell., 20′ 6″ x 36′; owner, Leonard Day; builder, John Hasty.

Ashmont St., cor. Carruth St., dwell., 32′ 4″ x 64′; owner, Chas. F. Kittredge; builders, Jackson & McDowell.

Brooklyn.

BUILDING PERMITS. — *Sixth Ave.*, n e cor. Twenty-second St., three-st'y brick store and tenement, tin roof; cost, $3,600; owner, Wm. Aiken, Fifth Ave. and Twenty-second St.; architect, G. M. Miller; builders, D. Gilmartin and Chapman & Purgold.

Milton St., n s, 300′ w Manhattan Ave., three-st'y brick dwell., gravel roof; cost, $8,500; owner, C. A. Waters; architect, C. Dunkhase; builders, J. B. Woodruff and S. F. Bartlett.

Nelson St., *Nos.* 165, 167 *and* 169, n s, 80′ w Court St., 3 three-st'y brick tenements, tin roofs; cost, each, $3,500; owner, architect and builder, Edward Keogh, 146 Luquer St.

George St., n s, 225′ e Knickerbocker Ave., three-st'y frame store and tenement, tin roof; cost, $4,000; owner, J. O. Kalb, 169 Boerum St.; architect, H. Vollweiler; builder, J. Herte.

George St., n s, 225′ e Hamburg St., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,600; owner and builder, E. Wade, Meserole St.; architect, H. Vollweiler.

George St., n s, 150′ e Knickerbocker Ave., 8 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, each, $4,000; owner and builder, Joseph Herte, 169 Boerum St.; architect, H. Vollweiler.

McKibben St., n s, 65′ e Ewen St., two-st'y brick packing-house, tin roof; cost, $6,000; owner, Fred. Figge, 289 Atlantic Ave.; architect, J. Platte; builder, J. McQuade.

Pacific St., n s, 200′ w Third Ave., 8 four-st'y brick tenements, gravel roofs; total cost, $11,500; owner, C. Lindquist, 500 Atlantic Ave.; architect and builder, T. Peason.

George St., n s, 250′ e Hamburg St., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,600; owner, E. Braun, Meserole St.; architect, H. Vollweiler; builder, E. Wado.

Hart St., n s, 200′ e Nostrand Ave., 4 three-st'y brick dwells., tin roofs; cost, each, $5,000; owner and builder, Thomas E. Greenland, 256 Kosciusko St.; architect, I. D. Reynolds.

Atlantic Ave., n w cor. Nostrand Ave., three-st'y brick and iron stores and tenements, tin roofs; cost, $14,000; owner, D. K. De Beixedon, 93 Hancock St.; builder, E. Sorenson.

Devoe St., *Nos.* 145-149, n s, 75′ w Graham Ave., 3 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,500; owner, architect and builder, Stephen J. Burrows, 321 Ainslie St.

Navy St., s w cor. De Kalb Ave., two-st'y brick factory, tin roof; cost, $11,000; owners, Chas. Cooper & Co., Broadway; architect, E. F. Gaylor; builder, J. Guilfoyle.

Fifth Ave., w s, 21′ 6″ s President St., four-st'y brick store and tenement, gravel roof; cost, $8,000; owners and builders, Assip & Buckley, 77 Hall St.; architect, F. E. Lockwood.

Fifth Ave., s w cor. President St., four-st'y brick store and tenement, gravel roof; cost, $10,000; owner, architect and builder, same as last.

Fifth Ave., w s, 42′ 6″ s President St., 2 four-st'y brick stores and tenements, gravel roofs; cost, each, $10,000; owner, architect and builder, same as last.

Melrose St., n s, 225′ w Knickerbocker Ave., three-st'y frame (brick-filled store and tenement, tin roof; cost, $4,000; owner and builder, Casp. Gessman, on premises; architect, G. Hillenbrand.

Troutman St., n s, 200′ e Evergreen Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,500; owner and builder, Henry Helscher, 105 Troutman St.; architect, G. Hillenbrand.

Nostrand Ave., e s, 80′ s Gates Ave., three-st'y brick store and dwell., tin roof; cost, $35,200; owner, John Strack, on premises; architect, I. D. Reynolds; builder, S. C. Whitehead.

McKibbin St., n s, 125′ e Lorimer St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $5,000; owner, Fritz Felten, on premises; architect, J. Platte; builder, J. Fallon.

Stagg St., s s, 235′ w Waterbury St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,500; owner, Jacob Schneider, 261 Stagg St.; architect, J. Platte; builder, U. Maurer.

Bleecker St., *No.* 66, n s, 325′ e Evergreen Ave., two-st'y frame dwell., tin roof; cost, $3,400; owner, Robert A. Sebury, 55 Cedar St.; builders, M. Myers and G. Pearse.

Reid Ave., w s, 24′ 6″ s Quincy St., 4 two-st'y brick dwells., tin roofs; cost, each, $5,000; owner and builder, S. W. Post, 860 Van Buren St.; architect, E. L. Messenger.

Reid Ave., s w cor. Quincy St., four-st'y brick store and flats, tin roof; cost, $15,000; owner, architect and builder, same as last.

Myrtle Ave., n s, 125′ e Marcy Ave., 2 four-st'y brick stores and tenements, tin roofs; cost for all, $21,000; owner, Thomas Rice, 809 Myrtle Ave.; architect, F. D. Van Pelt.

Lexington Ave., n s, 90′ w Throop Ave., 3 two-st'y brick dwells., tin roofs; cost, each, $3,500; owner and builder, John McDicken, 280 Marion St.; architect, Ernest Dennis.

Clermont Ave., e s, 237′ n Park Ave., three-st'y and cellar brick tenement, tin roof; cost, $7,300; owner, John F. Downey, 12 Vanderbilt Ave.; architect and contractors, M. Freeman's Sons; mason, J. J. Gallagher.

McDonough St., s s, 242′ 6″ e Tompkins Ave., 4 three-st'y brick dwells., tin roofs; cost, $7,000; owner, John Fraser, 10 Rochester Ave.

Willoughby Ave., s s, 80′ w Sumner Ave., four-st'y brick tenement, tin roof, iron cornice; cost, $9,000; owner and builder, M. J. McLoughlin, 100 Kosciusko St.; architect, J. Hall.

Lorimer St., s e cor. Jackson St., three-st'y frame store and tenement, tin roof; cost, $6,200; owner, N. Gebelein, Throop Ave., near Hopkins St.; architect, T. Engelhardt; builder, M. Metzen.

ALTERATIONS.—*Ewen St.*, n e cor. McKibben St., one-st'y brick extension, tin roof, interior and wall alterations, iron columns and beams; cost, $4,000; owner, Fred. Figge, 289 Atlantic Ave.; architect, J. Platte; builder, J. McQuade.

Johnson St., *No.* 113, three-st'y and basement brick extension, tin roof; cost, $3,600; owner, B. Stern, on premises; architects and contractors, Maurice Freeman's Sons; mason, J. J. Gallagher.

Chicago.

BUILDING PERMITS. — G. A. Myers, two-st'y flats, 3528-3532 Lake Ave.; cost, $18,000; architect, H. Sierks.

C. R. Schultze, two-st'y store and dwell., 338 Clybourne Ave.; cost, $3,000.

Mrs. M. C. Stearns, two-st'y dwell., 311-313 Michigan Ave.; cost, $30,000; architects, Burnham & Root.

Mrs. M. C. Stearns, two-st'y barn, Michigan Ave.; cost, $3,000.

C. Busby, two-st'y flats, 39-45 Park Ave.; cost, $17,000; architect, C. M. Palmer.

P. Welcome, two-st'y dwell., 3449 Forest Ave.; cost, $3,000.

Mrs. McMahon, two-st'y dwell., 555 Thirteenth Pl.; cost, $2,860.

Mrs. Flood, two-st'y store and dwell., 1265 South Western Ave.; cost, $4,800; architect, N. Keyo.

M. Turck, two-st'y dwell., 108 Fisk St.; cost, $2,500.

M. Neuzil, two-st'y store and dwell., 418 Eighteenth St.; cost, $3,500.

Schroder Bros. & Volkmann, five-st'y store, 135-137 Adams St.; cost, $30,000.

O. J. Nelson, five-st'y factory, 51-55 Pearson St.; cost, $11,000.

R. C. Rounsavoll, 2 two-st'y dwells., 289-291 Webster Ave.; cost, $8,000.

W. Jenkinson, 2 two-st'y dwells., 25-27 Lexington St.; cost, $5,000.

M. Cohn, three-st'y store and dwell., 358 Division St.; cost, $11,000; builders, Foley & Molloy.

Baker Bros., two-st'y dwell., 669 Monroe St.; cost, $8,000.

B. M. Hair, 2 two-st'y dwells., 899-901 Adams St.; cost, $12,000.

H. D. Cook, two-st'y dwell., 3217 Groveland St.; cost, $7,500.

S. J. Lahey, four-st'y store and dwell., 686-688 Madison St.; cost, $25,000; architect, G. Vigeant.

B. F. Baker, two-st'y barn, 183-185 Leavitt St.; cost, $2,500.

R. Krause, three-st'y flats, 289 Rush St.; cost, $5,000.

Mrs. M. E. Sands, 6 two-st'y dwells., 606-610 Congress St.; cost, $20,000.

J. Froche, two-st'y dwell., 308 North Ave.; cost, $4,000; architect, F. Kreplin.

J. D. Quinlan, two-st'y addition, 94 Randolph St.; cost, $7,000.

C. Bode, 3 three-st'y stores and flats, 510-214 West Twelfth St.; cost, $30,000; architect, C. Bode.

D. M. Thiele, two-st'y school-house, 835 West Taylor St.; cost, $10,000.

M. Bennett, two-st'y store and dwell., 623 West Chicago Ave.; cost, $3,200.

S. C. Hapgood, two-st'y store and dwell., 684 West Polk St.; cost, $2,500.

L. M. Bargebush, two-st'y store and dwell., 3044 Butler St.; cost, $3,200.
T. Campbell, three-st'y dwell., 57 Bellevue Pl.; cost, $7,000.
F. C. Jocelyn, two-st'y barn, Michigan Ave.; cost, $3,500.
M. Koenig, three-st'y store and dwell., 239 West Chicago Ave.; cost, $6,500.
Mrs. Klinirt, three-st'y livery stable, Halsted St.; cost, $8,000.
F. G. Dewes, two-st'y malt-house, 169 Rice St.; cost, $12,000.
R. A. Dowling, 17 two-st'y dwells., Robey St.; cost, $50,000.
L. L. Coburn, 2 three-st'y stores and dwells., 279-281 West Van Buren St.; cost, $8,000.
J. L. Hastings, 2 two-st'y dwells., 3526-3528 Portland Ave.; cost, $5,000.
J. Hanson, three-st'y dwell., 230 May St.; cost, $4,000; builder, Rosmussen.
W. H. Moore, two-st'y dwell., 3625 Grand Boulevard; cost, $7,000.
Helen H. Murray, 3 two-st'y dwells., 40-44 Bryant St.; cost, $7,500; architect, T. C. Meredith.
Kohn & Vanetta, additional st'y, 217-223 State St.; cost, $5,000.
H. H. Kohlsatt, barn, 196 Thirtieth St.; cost, $5,-000.

Cincinnati.

Building Permits. — U. S. Bung M'f'g Co., three-st'y brick dwell., cor. Evans and Eighth Sts.; cost, $6,000.
John Schulte, three-and-a-half-st'y brick dwell., cor. Coleman and Garden Sts.; cost, $5,000.
Mrs. Corey, addition, cor. Eighth and Walnut Sts.; cost, $2,800.
Gust Tofel, 2 two-and-one-half-st'y brick dwells., cor. Brown and Turn-Table Sts.; cost, $3,500.
Mrs. J. B. Gibson, two-st'y double brick dwell., cor. Saunders and Auburn Sts.; cost, $7,500.
Chas. Rosenthal, three-st'y brick dwell., cor. Heen and Abigail Sts.; cost, $3,500.
B. Heithhaus, two-st'y brick dwell., cor. Madison Pike and Woodburn Ave.; cost, $3,500.
Geo. Edwards, three-st'y brick dwell., cor. Poplar and Dalton Aves.; cost, $3,500.
Total cost to date, $205,711.
Cost of 14 repairs, $5,425.
Total permits, 5,503.

Kansas City, Mo.

Building Permits.— J. R. Hartzell, 5 frame houses, East Seventeenth St.; cost, $14,000.
Wm. Burke, frame block, Forest Ave.; cost, $10,-000.
A. E. Phillips, brick house, Independence Ave.; cost, $10,000.
B. S. Hayes, brick house, cor. Eighteenth and Woodland Ave.; cost, $9,000.
W. Campbell, brick block, East Sixteenth St.; cost, $5,000.
J. C. Morse, brick block, Campbell St.; cost, $12,-000.
Daniel G. Hewitt, brick block, Harrison St.; cost, $7,500.
Martin E. Tomlinson, brick block, Harrison St.; cost, $7,500.
F. Duncan, brick house, Dundee Pl.; cost, $3,000.
Producer's Marble Co., store, cor. Eighth and Mulberry Sts.; cost, $17,000.
M. A. Crathorne, frame store, 1609 East Eighteenth St.; cost, $3,000.
James Spencer, frame block, Tracy Ave.; cost, $7,000.
B. S. Hayes, brick house, cor. Eighth and Woodland Aves., cost, $9,000.
H. M. Kirkpatrick, brick block, 1317 and 1319 East Eighth St.; cost, $9,000.
S. H. Beverforden, brick block, Campbell St.; cost, $14,000.
Isaac Whittaker, store, 1214 Grand Ave.; cost, $17,000.
Yeager & Forbes, brick store and dwell., Grand Ave.; cost, $17,000.
Irving Queal, brick block, East Fifteenth St.; cost, $15,000.
D. P. McMahan, block, 1305, 1307 and 1309 Penn St.; cost, $15,000.
Carl Spangler, brick barn, Forest Ave.; cost, $2,-000.
J. L. Nofsinger, frame house, East Eighth St.; cost, $3,000.
Smith & Ginn, brick house, Wabash Ave.; cost, $5,000.
James McCollum, frame block, Olive St.; cost $5,-500.
T. H. Edwards, frame block, Park Ave.; cost, $5,-500.
George Ginn, frame house, Park Ave.; cost, $3,-000.
Wm. West, brick house, Wabash Ave.; cost, $5,000; brick block, cor. Olive and Independence Aves.; cost, $11,000; brick block, Wabash Ave.; cost, $20,000.
J. C. Morse, brick block, East Seventeenth St.; cost, $20,000.
J. O. Leist, brick house, Campbell St.; cost, $3,-000.
J. P. Newham, brick house, Holmes St.; cost, $4,-000.
Mrs. S. H. Taylor, brick house, East Fourteenth St.; cost, $3,700.
William West, 9 frame houses, Olive St., bet. Sixth and Independence Aves.; cost, $16,000.

Minneapolis, Minn.

Building Permits. — N. H. Bolton, two-st'y wood dwell. and barn, s s Clarence Ave., bet. University and Orlin Aves., e; cost, $3,000.
L. Jepson, two-st'y wood dwell., s s East Twenty-seventh Ave., bet. Nicollet and First Aves., s; cost, $3,000.
Jno. Orth, two-st'y wood dwell., n e s Marshall St., bet. Eleventh and Thirteenth Aves., n e; cost, $5,000.
E. F. Blecken, two-st'y wood dwell., s s Sixth Ave., bet. Royalston and Lyndale Aves., n; cost, $4,000.
C. A. Anderson, three-st'y brick store, e s Cedar Ave., bet. Fourth and Fifth Sts., s; cost, $16,000.
Jno. F. Wilcox, two-st'y wood factory, n e s Ramsey St., bet. Waverley and Eleventh Aves., n e; cost, 12,000.
Wm. Grimshaw, two-st'y brick store and offices, s w s Fourth St., bet. Nicollet and First Aves., s; cost, $3,000.
State University, three-st'y stone and brick State University Mechanical Building, University Campus; cost, $50,000.

New Haven.

Building Permits. — Following are the permits issued since my last report: —
Lloyd St., two-st'y frame dwell., 20′ 5″ x 40′; owner, Patrick Faisey.
Congress Ave., near Arch St., 2 two-st'y frame dwells.; cost, $4,000; owner, C. A. Moeller.
River St., near East Pearl, three-st'y brick and stone building, gravel roof; 40′ x 48′; cost, $5,000; owner, Quinnipiac Brewing Co.; architect, L. W. Robinson.
Cedar St., two-st'y frame dwell., 20′ x 30′; owner, A. C. Smith.
Beers St., 2 two-st'y frame dwells., 25′ x 50′; owner, T. J. Ackerman.
State St., four-st'y brick and stone business building, store and three flats, 18′ x 69′; cost, $10,000; owner, John L. Disbrow; builders, L. V. Treat & Sons.
Blatchley Ave., two-st'y frame dwell., 23′ x 40′; owner, Hubert E. Warner.
Wallace St., raise brick factory building, one-st'y, 32′ x 125′; owners, Sargent & Co.
Elm St., two-st'y frame dwells.; cost, $3,000; owner, Mrs. L. J. Smith; builder, N. Countryman.
Crown St., four-st'y brick and stone store, tin roof, 34′ x 71′; cost, $10,000; owner, George E. Hoadley; architect, David R. Brown.
The Quinnipiac Brewery, recently destroyed by fire, will soon be replaced by a new $50,000 brewery.

New York.

Building Permits.—*One Hundred and Forty-eighth St.*, n s, 200′ w Morris Ave., three-st'y brick tenement, flat tin roof; cost, $9,000; owner, Anna Weincke, 469 One Hundred and Forty-eighth St.; architects, Schmidt & Garvin, 26 Church St.
One Hundred and Eighteenth St., s s, 90′ e Fourth Ave., 2 five-st'y brick tenements, flat tin roof; cost, $36,000; owner, Simon Haberman, Belleville, N. J.; architect, John Brandt, 1491 Third Ave.
East One Hundred and Forty-third St., No. 737, two-st'y and basement brick dwell., flat tin roof; cost, $4,500; owner, Matthew Hicks, 349 East Twelfth St.; architect, Daniel Ryan, 778 Sixth Ave.
Forty-fourth St., s s, 100′ w Eleventh Ave., one-st'y brick storage, flat tin roof; cost, $3,000; owner, Elias. S. Higgins, 137 Fifth Ave.: architect, Wm. Paul, 269 West One Hundred and Twenty-fifth St.
Lexington Ave., *Nos.* 585 *and* 587, e s, bet. Fifty-first and Fifty-second Sts., 2 five-st'y tenements, brown-stone fronts, flat tin roofs; cost, $80,000; owner, Rudolph Bohm, 270 Grand St.; architect, Wm. Graul, 12 Stanton St.
Ninth Ave., e s, com. s e cor. Fifty-sixth St., 4 five-st'y brick flats, flat tin roof; cost, $140,000; owners, Lesser & Michael Steinhart, 740 Lexington Ave.; architect, Geo. B. Pelham, 56 Wall St.
West Fifty-sixth St., 70′ e Ninth Ave., five-st'y flat, flat tin roof; cost, $50,000; owners, Lesser & Michael Steinhart, 740 Lexington Ave.; architect, George B. Pelham, 56 Wall St.
One Hundred and Twenty-fifth St., n s, 25′ e Second Ave., 5 five-st'y brick tenements, flat tin roofs; cost, $75,000; owner, John Livingston, 130 East Seventy-first St.; architect, F. T. Camp, 60 Liberty St.
Second Ave., n e cor. One Hundred and Twenty-fifth St., five-st'y tenement, flat tin roof; cost, $18,-500; owner, John Livingston, 130 East Seventy-first St.; architect, F. T. Camp, 60 Liberty St.
Ninth Ave., e s, 50′ 5″ n One Hundredth St., five-st'y brick tenement, flat tin roof; cost, $11,000; owner, S. E. Hinman, 243 West One Hundred and Thirty-first St., architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.
Ninth Ave., e s, 20′ s One Hundred and First St., 3 five-st'y tenements, flat tin roofs; cost, $30,000; owner, R. Havanagh, 185′ East Sixty-fourth St.; architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.
One Hundred and Twenty-ninth St., s s, 280′ e Fourth Ave., five-st'y brick tenement, flat tin roof; cost, $19,000; three-st'y brick building, flat tin roof; cost, $6,000; owner, Theo. Dreterlen, 41 West One Hundred and Twenty-seventh St.; architects, Cleverdon & Putzell, 110 East One Hundred and Twenty-fifth St.
Brook Ave., s w cor. One Hundred and Thirty-first St., two-st'y brick building, flat tin roof; cost, $6,-000; owners, Gas Engine & Power Co., 132 Church St.; architects, D. & J. Jardine, 1262 Broadway.
One Hundred and Twenty-second St., n s, 109′ 6″ e Second Ave., two-st'y brick building, flat felt and asphalt roof; cost, $6,000; owner, William Sinclair, 325 East One Hundred and Twenty-second St.; architect, Charles Baxter, 108 East One Hundred and Twenty-fifth St.
Rivington St., *Nos.* 259 *and* 261, 2 five-st'y brick tenements, flat tin roof; cost, $16,000; owner, John A. Deraismer, 114′ East Twenty-fifth St., architects, Berger & Baylies, 52 Bible House.
Jane St., *Nos.* 158 *and* 160, 2 three-st'y brick buildings, flat tin roofs; cost, $9,000; owner, John S. McLean, 7 East Sixty-third St.; architect, Charles E. Hadden, 102 South Fifth Ave.
Church St., s cor. Webster Lane, three-st'y and basement brick and wood dwell., mansard roof; cost, $4,000; owner, Peter Murray, King's Bridge; architect, George Raynor, Yonkers, N. Y.
Eighth Ave., w s, 75′ w One Hundred and Forty-fourth St., five-st'y tenement, brick and brownstone trimming, flat tin roof; cost, $20,000; owner, Fred'k Stetler, 51 Palisade Ave.; architect, R. H. Rowden, 777 Broad St., Newark, N. J.
Alterations.—*Fifth Ave.*, w s, Fifty-eighth to Fifty-ninth St., eight-st'y brick building, brick and stone front, addition; cost, $40,000; owners, Phyfe & Campbell, Fifth Ave., w s, Fifty-eighth to Fifty-ninth St.; architect, Geo. W. Da Cunha, 32 Liberty St.
Tenth Ave., *Nos.* 362 *and* 364, five-st'y brick tenement, internal alterations and repairs; cost, $5,000; owner, Geo. Wendleker, n w cor. Twenty-fourth and Broadway; architect, William Haw, 51 East One Hundred and Thirty-second St.
Greenwich St., *Nos.* 393 *to* 397, five-st'y brick storage building, internal alterations; cost, $13,000; owners, F. C. Linde & Co., cor. Laight and Vaucker Sts.; carpenter, Geo. A. Banta, 326 and 328 West Twenty-first St.
Washington Pl., *No.* 25, four-st'y brick dwell., to be raised 5′, internal alterations; cost, $4,000; owner, Jose De Navarro, 25 Washington Pl.; architect, Hubert, Pirsson & Co., 19 East Twenty-eighth St.
Ninety-third St., s s Eighty-fifth St.; w Second Ave., five-st'y brick storage building, internal alterations; cost, $10,000; owner, George Ehret, s e cor. Ninety-fourth St. and Fourth Ave.; architects, A. Pfeund & Son, 232 West Thirty-sixth St.
Nassau St., *Nos.* 75 *and* 77, four-st'y and attic brick office building, internal alterations and repairs, flat tin roof; cost, $10,000; owner, C. F. Kingsland, Tarrytown, N. Y.; architect, Alfred E. Barlow, 149 Broadway.

Philadelphia.

Building Permits.—*Ninth St.*, n w cor. Girard Ave., market-house, 190′ x 198′; Jas. B. Doyle, contractor.
Twenty-fifth St., e w cor. Montgomery Ave., one-st'y church; Jno. M. Anderson, contractor.
Frankford Road, cor. Ontario St., two-st'y stable, 18′ x 32′, H. L. Leavitt, contractor.
Church St., cor. Lackawana, St., two-st'y building, 25′ x 43′; J. P. Yerkes, contractor.
Geisler St., n w cor. Thompson St., three-st'y factory, 40′ x 75′; Judge & Co., contractors.
Charles St., w Thirty-seventh St., 4 three-st'y dwells.; Thomas Bodman, owner.
Lehigh Ave., w Twelfth St., 2 three-st'y dwells.; Frederick Woelfel, owner.
Tulpenhocken St., e Germantown Road, 2 two-st'y storehouses; Thos. W. Wright & Son, contractors.
Copsal St., above Morton St., 2 two-st'y dwells.; T. W. Wright, owner.
Twenty-first St., s Norris St., 9 three-st'y dwells.; P. A. B. Widener, owner.
St. Mark's Pl., w Sixteenth St., 22 two-st'y dwells.; J. J. Williams, owner.
Cherry St., w Tenth St., three-st'y factory, 35′ x 68′; Frank Tweed, contractor.
Lynn St., w Twenty-second St., six-st'y warehouse, 33′ x 65′; Frank Tweed, contractor.
Front St., s e cor. Bainbridge St., three-st'y office; Harrison, Havemeyer & Co., owners.
Oxford St., w Twenty-second St., 2 two-st'y dwells.; Robert Paul, owner.
Hancock St., cor. Harris St., 2 three-st'y dwells.; Jno. Spreckley, owner.
Front St., n Callowhill St., four-st'y store, W. F. Cook, contractor.
Fifty-seventh St., e Vine St., 2 two-st'y dwells.; A. A. Anderson, owner.
Nineteenth St., cor. Montgomery Ave., two-st'y boiler-house and drying room; Chas. Longcope, contractor.
Tenth St., cor. Westmoreland Ave., 2 two-st'y dwells.; Wm. Garvin owner.
Baltimore Ave., cor. Forty-first St., addition to church; D. C. Schuler, contractor.
Germantown Ave., *No.* 2639, three-st'y dwell.; Jos. Parks, contractor.
Lehigh Ave., e Eighth St., 9 three-st'y dwells.; M. L. Heish, owner
Lehigh Ave., e Eighth St., 2 two-st'y dwells.; M. L. Heish, owner.
Seventh St., above Girard Ave., three-st'y dwell. G. B. McDowell, contractor.

St. Louis.

Building Permits.—Fifty-one permits have been issued since our last report, twenty-three of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—
Geo. Beinhardt, 3 adjacent two-st'y brick tenements; cost, $7,000; J. C. Hucker, contractor.
N. Pelligreen, two-st'y double brick dwell.; cost, $3,200; N. Piiligreen, contractor.
James O'Brien, 2 adjacent two-st'y brick dwells.; cost, $4,300; T. J. Kelly & Co, contractors.
F. Julian, two-st'y brick flat; cost, $3,000; W. Merrill, contractor.
F. Breitshied, two-st'y brick dwell.; cost, $2,800; Volke & Tache, contractor.
Geo. Ande, two-st'y brick store and tenement; cost, $5,500; F. Mueller, contractor.
W. C. Walls, 2 adjacent two-st'y brick dwells.; cost, $6,000; J. B. Legg, architect; sub-let.
F. Jutz, 2 adjacent two-st'y brick dwells.; cost, $5,000; J. J. McMahon, contractor.
O. O. Todd, 2 adjacent two-st'y brick dwells.; cost, $7,777; J. W. Barnes, contractor.
Jos. Epstein, 2 adjacent, two-st'y brick dwells.; cost, $4,200; Wm. Damon, contractor.
T. T. Watts, two-st'y brick dwell.; cost, $3,000; C. C. Helmers, architect; sub-let.

Washington D. C.

Building Permits. — Peter McCartney, 6 two-st'y brick buildings, Pennsylvania Ave., between Twenty-fourth and Twenty-fifth Sts., n w; cost, $9,000.
National Union Ins. Co., 6 two-st'y brick dwells., Valley St., bet. Stoddard and Road Sts., n w; cost, $10,500.
J. H. Merriweather, three-st'y brick dwell., Thirteenth St., bet. S and T Sts., n w; cost, $4,000.
W. Clarence Duvall. 3 three-st'y brick dwells., M St.; bet. Eighteenth and Nineteenth Sts., n w; cost, $21,500; C. C. Martin, builder.
M. A. Montgomery, 3 two st'y brick dwells., Thirteenth St., bet. W and Boundary Sts., n w; cost, $6,-000.
M. A. McGowan, 3 two-st'y brick dwells., N St., bet. Thirty-second and Thirty-third Sts., n w; cost, $6,000.
S. E. Lewis, 3 three-st'y brick dwells., P St., bet. Fourteenth and Fifteenth Sts., n w; cost, 11,000; N. W. Poindexter, architect; W. C. Monson, builder.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 514.

OCTOBER 31, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE Convention of the American Institute of Architects in Nashville last week seems to have been an extremely pleasant, if not very notable one. The attendance was small, less than thirty members of the Institute having been present at any of the meetings; but we can answer for it that a great many more wished to go, and would have done so if their duties had permitted it. The feeling that the Institute was less fully represented than usual seems to have prevented the introduction of any new business of importance, except the adoption, after amendment, of the draft of a bill for defining the duties of the Government Architect, prepared by a committee appointed last year; and after transacting routine business and reading the few papers presented, the Convention gave itself up to the enjoyment of the kind courtesy which everywhere attended it. Some of the reports will be found in another place, and it it only remains to say here that the Convention, fortunate, perhaps, in having escaped any exciting discussions, adjourned with the conviction that it would be many years before it would meet for a pleasanter session.

THAT admirable institution, the New York Trade School, has fallen under the stupid and brutal displeasure of the individuals who control the trades-unions of that city. According to the professions of these persons, it is desirable to restrict the number of members of the various trades, and with this object the education of young men to enter them is to be obstructed in every possible way. Two years ago the bricklaying class in this school, which was managed, according to the accounts, with special ability and efficiency, was forcibly broken up by the leaders of the unions, who decreed that no member of the organization should give instruction in it. Emboldened by the result of this malicious attack, a general campaign against the school has, it is said, been ordered for this winter, and as the trade school is carried on by private individuals, at their own expense, for the benefit of working people, it is only too likely that the attempt of the latter, through the men whom they suffer to lead them, to deprive themselves of the advantages which the thoughtful kindness of their richer fellows has provided for them, will have complete success. If the trades-unions took any other precautions to keep men out of the professions which they wish to control, it would seem less unreasonable to shut the door against the skilled workers whom the schools endeavored to turn out; but so long as nothing is needed for admission except subserviency to the union delegates, and a slight acquaintance with the processes of a trade, the net result, and, as we are inclined to think, the intended result of the suppression of the schools will be to shut the door of the trades against ambitious and well-trained workmen, while it is left wide open for the dull and half-taught ones. It has not taken the "labor reformers" long to find out that their power lies mainly among those who are incapable of thinking for themselves, and are therefore easily led wherever it suits the purposes of their masters to take them. Thoroughly skilled men, whose work is worth three or four times as much as that of their careless and ignorant comrades, are not only often unruly when their common-sense opposes the edicts of the delegates, but are apt to be dissatisfied at heart with a system which reduces all the members of a trade to the standard of the meanest botches in it, and does its best to destroy forever, from the moment when a man puts his neck into its yoke, both his ambition and his hope for advancement in life through his own ability or industry; and it is easy to see that the cutting off, by closing the trade schools, of a source of supply from which not only workmen of the highest class, but a standard of superior workmanship, would be continually disseminated through the city, must seem to the upholders of the present condition of the trades extremely desirable.

THE *Real Estate Record and Guide* of New York, which contains a great deal of sensible and intelligent comment upon architectural matters in that city, says that the fashion of introducing novel effects in the exterior of dwelling-houses, which was so prevalent three years ago, seems to have died out, and the structures now in process of erection have generally plain fronts of brownstone or brick. From this the writer infers that architectural extravagances, such as those which give picturesqueness to Fifty-seventh Street and the neighboring region, have proved unprofitable to the builders who invested their money in them, and believes that there is little hope of the revival of a lively taste in house-building on Manhattan Island. He suggests, however, that the "annexed district," north and east of Harlem River and Spuyten Duyvil Creek, which has been laid out with winding streets and large open spaces, presents much more suitable sites for picturesquely broken buildings than the formal squares of the city proper, and hopes that architects will use their influence to secure the occupation of this region by detached or semi-detached houses, surrounded by gardens, and offering attractions in the way of beauty and healthfulness which are sought in vain in the older parts of New York.

WITHOUT objecting in the least to the conclusions of the writer in the *Record and Guide*, we are disposed to think that the decline in picturesque city architecture has been due much less to the unremunerative character of investments in oriels and turrets than to the change in the municipal regulations in regard to building, which now forbid any of those encroachments on the street lines, in the way of projections and bays, which once did so much to break up the monotony of the street façades. It is not easy for the best architect to give picturesqueness to a flat four-story front, twenty-five feet wide, and the praiseworthy efforts which are often made by the owners on a given street, to persuade all who build on the street to set their houses far enough back from the street line to allow of pleasant bays and oriels in the reserved space, are usually thwarted by the obstinacy of some "hog," to give him the title which his neighbors generally bestow upon him, who insists on thrusting the clumsy square mass of his own house into the space which it was decided to keep open. For this reason, more than any other, the New York architects have returned to something like the monotonous flatness of design of twenty years ago; but it is due to them to say that they have found means to deal with their severe restrictions in ways which are often surprisingly clever. Not to mention particular instances, the professional visitor to the upper portion of New York is now constantly struck by successful devices for securing shadow in the middle of flat fronts, as well as by most interesting examples of façades in which no relief is attempted, which give him, we think, quite as much pleasure as the mingled compositions and caricatures of Fifty-seventh Street; and although we are willing to go even farther than the *Record and Guide* in assuring owners and architects who are disposed to adorn the unrestricted districts with beautiful detached houses, like those of Hampstead and Chelsea, or like the little detached "hôtels" which cover the new and fashionable part of Paris, that the taste for such habitations is already prevalent enough in New York to ensure success to those who cater to it wisely, we trust that the beginning of the work of improvement, if not also the end of it, may be entrusted to architects

who can temper the exuberance of their fancy with a little dis cretion.

THE *Sanitary News* quotes from the proceedings of the Sanitary Institute of Great Britain some sensible remarks by Mr. John Honeyman upon the advantages of low ceilings for the rooms of the smaller class of houses. In Mr. Honeyman's opinion, the popular notion that high ceilings are conducive to the healthfulness of rooms is erroneous. It is true that a room with a high ceiling contains a larger cube of air, and, supposing the atmosphere of such a room to be perfectly pure to begin with, a man could exist longer in it before dying of suffocation than he could in a low room. Here, however, the sanitary advantages of the high room end; and ventilation, properly so called, that is, the constant change of the atmosphere, goes on, as most architects know, more satisfactorily in a room with a low ceiling than a high one. If the windows and doors extend nearly to the ceiling, as will usually be the case if the room is not much more than eight feet high, the leakage of air which goes on to a very great extent around them keeps all parts of the atmosphere of the room in motion, instead of moving the lower portion only, leaving an inverted lake of foul and hot air undisturbed under the ceiling, as is always the case where high rooms, inhabited in winter, depend for the movement of the air in them upon openings placed at some distance below the ceiling. To have the currents of fresh air circulate only in the lower part of the room, leaving the upper portion of the air in it unaffected, is practically a much worse way of ventilating the room than, with the same movement of the air, to cut off the upper stagnant portion of it by a low ceiling, for the stagnant atmospheric lake under the high ceiling, although motionless, keeps actively at work, under the law of the diffusion of gases, fouling the fresh currents which circulate beneath it; while with low rooms and high windows no accumulation of stagnant air can exist, the hot and foul atmospheric strata being swept constantly from the ceiling by the currents, just as dust is swept from the floor by a broom. Indirectly, moreover, the low ceiling improves the healthfulness of the room by its economy of heat. In a lofty room the poor man's stove expends a large amount of its energy in warming the ceiling, and the floor of the tenement overhead, without doing its owner any good whatever. It is only necessary to sit on top of a step-ladder for a while in a high room artificially warmed, to be convinced, without reference to a thermometer, that the temperature next the ceiling is in all ordinary cases far higher than that of the remaining air in the room. If the ceiling is not more than eight feet high or so, with windows to the top, diffusion coöperates with the atmospheric currents to bring the warm air at the ceiling down where it can be felt by the people in the room, while the cool drafts which blow in above the windows and doors, striking first upon the ceiling close by, carry off from it by convection a very considerable amount of heat, for the further comfort of the poor tenant's family. Saving thus a large part of the heat from the stove, which would otherwise be wasted, the proprietor of the room is less disposed to convert his room into an air-tight box, by stopping up all the crevices around the windows and doors with weather-strips or rags, and even if he begins, from force of habit, to do so, the currents from the upper part of the windows and doors are, if they strike on or near the ceiling, so quickly modified in temperature as not to be felt as cold drafts; and this source of fresh air is left unmolested. In practice, we believe that most persons accustomed to observe the condition of air in inhabited places will agree that where similar means are provided for supplying and withdrawing air, such as a register and a fire-place, low rooms are, as a rule, decidedly fresher than high ones. In many cases a lofty room, supplied with pure warm air from a register, and ventilated by an open fire, will be found very oppressive, apparently from the influence of the large volume of stagnant air in the upper portion; while low, old-fashioned rooms with fire-places are almost always fresh and pleasant.

A LEGAL decision of interest to architects and builders is reported in the *Iron Age.* A man whom we call W. bought of H. an engine and boiler to be used in a mine, and to be paid for in one year if everything worked to his satisfaction. Six weeks after the sale W. failed, and assigned his property for the benefit of his creditors. The assignee carried on the mine for about a year, using the machinery in question, and then sold it to S. H., the maker of the engine, then claimed it from S., and brought suit to recover it. The first court in which the case was tried decided in his favor, but on appeal to the Supreme Court of the State the decision was reversed, the judge holding that although the contract of sale was conditional upon the trial and approval of the buyer, and had not been completed by a definite approval, yet in such contracts an implied approval might, in the absence of express notice, complete the sale; and as W. had never expressed any dissatisfaction with the engine and boiler, and had included them in his schedule of assets at the time of his failure, as if there had been no question in his mind of the completion of the contract, it seemed plain that he considered any further evidence of approval unnecessary. This view was confirmed by the conduct of the seller, H., who had made no objection to the transfer of the machinery to the assignee with the bankrupt's other assets, and had even repaired the engine for the assignee, a month after the failure, without claiming it as his; and the judge thought that, having allowed matters to go so far without objection, it was too late for him to set up a claim to the machinery after an innocent third party had purchased it from the assignee and paid for it.

A SINGULAR question of professional responsibility is discussed in the last number of *La Semaine des Constructeurs.* It seems that some time ago an architect was employed to make plans and draw up specifications for a school-building, to be erected at the expense of a certain rich citizen of the place. This task he performed to the satisfaction of his principal, and supervised the staking out of the building, but at this point the proprietor thought he saw an opportunity for economy, and he arranged with the architect to dispense with his services in superintending the execution of his plans, securing in this way a reduction of one-third in his bill. In place of the architect a bailiff and under-bailiff were set to direct the work, which went on quietly, the architect being called upon only at rare intervals, to explain portions of his drawings which seemed obscure to the amateur superintendents. Three years after the completion of the building defects appeared. The girders, which had been put in green, and of a local timber, instead of the sort called for by the specifications, rotted off in the walls, and the floors threatened to fall. The bailiffs, through whose ignorance the defective timber had been allowed to be used, were naturally unable to trace the evil effects of their incapacity, and, as usually happens in such cases, fell upon the architect, whom they proposed to hold responsible for the decay of the floor. The latter seems to have been sufficiently alarmed by the attack to appeal for advice to the law editor of *La Semaine*, who comforts him by saying that inasmuch as neither defects in his plans and details, nor in his staking out of the ground, nor in his specifications, which called for proper timber, were the cause of the trouble, his responsibility is not in any way engaged. It would be preposterous, he goes on to say, to hold an architect responsible for the incapacity of the men who had thrust themselves into his place to deprive him of a third of his pay; and he need have no fear that any tribunal would support their claim.

A CORRESPONDENT asks us what will be the bulk of the mass of concrete formed by mixing together a certain number of barrels of cement of various kinds, sand, water and pebbles. It would be impossible to answer the question with any accuracy, for the reason that nothing short of actual test would determine the proportion, in any given sample if sand, or gravel, or broken stone, of the voids to be filled with cement. It is easily seen that with spherical particles of sand or gravel, touching each other only at tangent points, the proportion of voids to the whole would be about at its maximum, while a mass of angular pieces may have a proportion of voids ranging from one-third of the whole or even more, to nothing, according to the closeness with which the pieces are wedged together. The process usually adopted by engineers in determining the proportions of the ingredients in mortar or concrete is to put some of the sand or gravel to be used into a barrel, and add water in measured quantities until it appears at the surface. The ratio between the amount of water added and that of the gravel or sand shows the proportion of voids; and the concrete is usually so mixed that the voids shall be a little more than filled with mortar, and the concrete will therefore occupy, if the ingredients are well proportioned, somewhat more space than the gravel alone.

STROLLS ABOUT MEXICO.[1] — VIII.

FROM THE CAPITAL TO QUERETARO.



I HAVE never found a railway journey in Mexico lacking in interest, and I have made a goodly number in that country. The frequent changes of scenery and climate, and the unprosaic customs of the country fill a day spent in looking out of the car-windows with an agreeable variety. While the Mexican Central Railway was under construction, many important places, formerly almost inaccessible for the ordinary traveller, were continually being brought within easy reach of the capital. Whenever opportunity offered, I would take a run of two or three days up the line, for a look at some one or other of these cities. Starting out in the early morning, the magnificent valley of Mexico, the historic land of Anahuac was at all seasons a noble spectacle. The sky was always clear, and the early sunlight, shining full on the face of Ajusco, brought out every feature of that noble mountain, the third highest of those in sight from the valley, and the nearest at hand. Soon we were winding among the foot-hills, and from our increasing elevation we could overlook a considerable section of the lovely landscape, its fertile fields dotted with villages and crossed by long lines of trees bordering highways and canals. The way out of the valley lay through the famous cut of Nochistongo, the railway running on a shelf high up on the right bank. The attrition of something like a century has gullied and seamed the sides until the cut looks like a work of Nature. This great engineering work, had it been carried out according to the original plan of its author, would have solved the problem of the drainage of the valley, which still vexes the Mexican Government and threatens the capital with ultimate ruin. It remains a monument to the folly of the interference of authorities with works concerning the proper execution of which they are necessarily ignorant, although they think they can rightly indicate the way in which everything should be done; a habit which engineers and architects doubtless find surviving to this day to some extent.

Enrico Martinez, the engineer, proposed to tunnel at a lower level the mountain blocking the northerly end of the valley, thus draining Lake Texcoco completely away. It was a daring project for those days, but the remedy would have been complete. It was too daring, however, for the authorities to adopt in all its thoroughness. They thought, for one thing, that allowance had not been made for a fall sufficient to carry off the water, holding to the ancient rule laid down by Pliny of six inches fall for every hundred feet; but the plain professional sense of Martinez told him that his plan was right. The plan was modified to a tunnel which should divert only the Cuantitlan river out of the valley.

The tunnel was begun in 1607, and though 6,600 metres, or 21,650 feet long, so easily worked was the *tepatate*, or hard, rock-like gravel excavated, that it was finished in less than a year. So great was the haste to use it that the water was turned on, against the protest of Martinez, before the arch could be brick-lined. Consequently the tunnel soon caved in, causing one of the worst floods from which the city had suffered. Poor Martinez was thrown into prison as a scapegoat, but, after four years of suffering, was released, for his services were wanted to superintend the excavation of a cut unwisely decided upon as a substitute for the tunnel, which might have been repaired. The great engineer's life was not long enough for this job; he died at his task at the end of thirty-five years, and the cut was not completed until 1789, at the cost of many, many thousand Indian lives; tradition placing the number from one hundred thousand to two hundred thousand. The cut has been in service ever since, and has proved the means, though inadequate, of preventing the continual inundation of the capital. It occasionally gets choked up, and is, it is said, only kept open through constant vigilance and labor. The diversion of the waters of the Cuantitlan keeps Lake Texcoco, under ordinary circumstances, from rising to a dangerous height, but the lake is rapidly filling in with the washings from the mountains, and has diminished from a depth of forty or fifty feet, at the time of the Conquest, until its greatest normal depth is now two metres, or six feet eight inches, while it is shoaling at the rate of four centimetres, or one and six-tenths inches a year. The surface of the lake being but six feet below the level of the city, any drainage worthy of the name is practically impossible under present conditions. With the filling-in of the lake the underground water therefrom, which permeates the porous ground upon which the city is built, is getting nearer the surface, making conditions continually growing more favorable for disease, as shown by the increasing death-rate. Were it not for the rare, dry air of an altitude of nearly seventy-five hundred feet, almost the entire population would inevitably be swept away by pestilence. A plan for removing the sewage by a suction system, utilizing the machinery of the electric-light company, has recently been favorably considered by the city government, but nothing permanent can be accomplished until the original project of Martinez is carried out, and Lake Texcoco is drained from the valley.

The plan for effecting this has been devised by the eminent Mexican engineer, Francisco de Goray. Though it requires an expenditure of over eight million dollars to carry it out in full, it promises to be worth the cost, for, besides making the habitable conditions of the valley well-nigh perfect, it will replace the lake and its now useless surrounding marshes with vast tracts of the most fertile tillable land. The plan is very comprehensive, including a tunnel over five miles long, a main canal thirty and one-half miles long, and over two hundred and fifty miles of branch-canals for drainage, navigation and irrigation, while the city would be provided with a thorough system of sewers, flushed by canals from Lake Xochimilco.

Leaving the cut, we soon descend to the ancient city of Tula, famous as the capital of the Toltecs, centuries before the Aztec occupation. The climate is markedly warmer than that of Mexico, the altitude being considerably less. Some of the little Indian dwellings hereabouts are of a peculiar type. They are very small, with only one room, and have a barrel-arch roof of stone or brick, making them resemble tombs in aspect. For a number of miles we pass through the narrow and beautifully verdant valley of the Tula River, and then ascend abruptly to expansive, rolling table-lands, soon reaching the highest point on the line between the City of Mexico and the United States. The landscape has noble, rolling lines, and we look off through the thin, transparent air, miles away into wide, deep valleys, filled with soft haze which seems to be palpitating with tropic heat. The straight lines running up distant mountain-sides here and there are the stone walls which divide great estates, there being in Mexico few small landholders. The population is scanty on these uplands; there are humble Indian villages now and then, some of the hovels with roofs of red tile, while occasional flower-gardens or blooming plants in pots testify to the universal Mexican love of the beautiful.

We descend as abruptly and more deviously than we rose, coming suddenly upon the considerable city of San Juan del Rio, with its midsummer temperature contrasting with the cool airs we have just left above. A good dinner, with forty minutes to eat it in, and we dart away over a long stretch of track which we have already seen from the hillsides over the city, cleaving the broad, green-floored valley straight as an arrow for miles and miles, or kilometres and kilometres, as we should say in Mexico, where the metric system is, very sensibly, the standard.

At last the valley narrows and our way becomes tortuous, sterile and rocky, finally entering a bit of paradise, walled by high cliffs, floored with a green carpet of tropical gardens threaded by a sparkling stream. It is the Cañada de Querétaro, the most charming bit of scenery on the line. Just before the cañon widens out into the plain we come upon great factory buildings, more ornate than our northern structures. They belong to the great Hercules Mills, the largest cotton factory in Mexico.

Water from this cañon is carried into Querétaro over the noblest aqueduct I have ever seen, with graceful arches, tall and slender, towering high above our train as it passes underneath. Though finished in the year 1738, the clean, dry air has preserved it so that it looks as new as if just built. It was projected and built by a wealthy citizen of Querétaro, the Marquis of La Villa del Villar del Aguila, who contributed $88,287 of the $124,791 which it cost.

Querétaro bears out in itself the promise of its beautiful approach. I fell at once into the leisurely spirit of the place, and felt indifferent to the fact that the bright new street-car drawn up in waiting beside the station did not depart for half an hour. What is the use of hurrying, I mused. We Northerners blame the Mexicans for laziness, but then we have to scurry around and devote nearly all our energies to secure the means to brave the rigors of our climate; here little suffices, and they would be foolish to exert themselves to no end. At all events they have found time to build more enduringly than we, and I contemplated with contented admiration the graceful towers and beautiful domes that clustered in groups over the low houses of the city, near by, rising gently from the *alameda*, the pleasure-ground covered with fine ash trees, almost within a stone's-throw of the station.

The narrow, rambling streets were very clean. The prevailing building material was a light-red and very smooth stone, quarried near the city, and easily worked, but becoming harder than marble by exposure. The little pleasure-gardens occupying the plazas, squares, and the spaces in front of public buildings, were unusually abundant and beautiful, even for a Mexican city; small orange and large banana trees adding to the luxuriance of the vegetation, brilliant with flowers. The abundance of the water-supply brought by the great aqueduct was shown by the fountains of clear water abounding everywhere. At intervals on the corners stood quaint-looking towers, and the gurgling sounds from within indicated that they belonged to the water-service and were used to regulate and equalize the pressure over the city. These towers varied in form, and were charming features of the streets. One square tower with an iron balcony was embowered in shrubbery in the pretty bit of garden in front of the old convent of Santa Clara, and another notable one, on the corner beside the fine old church of San Augustin was octagonal in shape, with a pyramidal cap; the double-headed eagle carved on the front told, I should say, that it was built under the reign of a Spanish king who was also German emperor. Another stood on the hillside corner of a plaza like a mediæval turret. In the garden of this plaza was a fountain with a tall column, and, at the base, four marble dogs looking dejectedly down into the basin, with water flowing from their mouths. A fountain at the corner of one of the

[1] Continued from page 136, No. 508.

market-places bore the inscription that the market and fountain were given by the governor of the State, from his salary, in 1848; the benefactor's name was modestly withheld, showing his disinterested public spirit.

Querétaro is noted among Mexican cities for its devotion to the mother church. Its churches are many and fine; a goodly number with convents adjacent, or what were convents, for they have all been sequestered since 1857, and they now stand deserted and falling into ruin. The pious citizens fear to touch the property, believing that it would be sacrilege. In most other cities the old convents have been converted to secular uses, but here they all remain on the hands of the Federal Government. Some day there will be persons bold enough to buy up these estates at a bargain. Many of these convents in Querétaro are on a great scale, notably that of Santa Clara and that of La Cruz, whose structures covered land enough to make respectable city wards. A street has been cut through the heart of Santa Clara, and one end of the thoroughfare is still spanned by the vaulted arch of a chapel. The Church of Santa Clara is a small one, but its interior has a gorgeous aspect, the abundance of elaborate wood-carving, heavily gilded, making the walls look like those of a gold-encrusted grotto. Adjoining the church of San Augustin is the convent of the same name, with its court, like the church itself, in rich Renaissance, with elaborate sculpture; artistic ingeneral effect, but crude in detail. The churches have marked individuality in architecture, running from almost pure Romanesque to florid Rococo. One has a pagoda-like cap upon a slender tower. The cathedral had been recently reconstructed and its façade completely spoiled; but its stately tower had fortunately not been touched, and there was one near view of it undisturbed by the ugly front, showing it rising above the ruins of a semi-demolished convent which was undergoing a slow transformation into a State palace.

Querétaro is full of melancholy associations with the Emperor Maximilian, for it was here that he fell after a gallant resistance to the besieging Republicans. The convent of La Cruz, occupying the highest ground in the city, was his citadel. The church is a curious one, for, instead of the customary two towers and a dome, it has two domes and one tower. In fact it is a double church, with two naves side by side, communicating by a small archway. There is a beautiful view from the church tower, and a student of the siege might pick out all the points of the memorable conflict. The Cerro de las Campanas, the Hill of the Bells, where Maximilian was shot with his generals, Miramon and Mexia, on June 19, 1867, is about a mile to the westward of the city. It is a low elevation, but, rising in the midst of a broad valley, commands a view of idyllic loveliness, with nothing but the sterile ground of the hillside itself to suggest the tragedy of the place, probably the saddest that ever closed the life of a Hapsburg. When I first visited the spot, there was nothing to mark the event but three rude little stone-heaps; but three plain monuments have since been erected there, and an iron fence built around them. Sylvester Baxter.

THE NINETEENTH ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS.

SALUTATORY ADDRESS BY DR. T. A. ATCHISON.

Mr. President and Gentlemen of the Association: —

I am honored in being chosen to extend to you a hearty, old-fashioned, Tennessee welcome. Though organized twenty years this is the first time you have crossed the border line into the land of flowers. I might have said Mason and Dixon's line, but that has been wiped from the maps and well nigh forgotten. True, it cost much blood and treasure, but a restored universal manhood and brotherhood is cheap at any cost. You are now on ground which once resounded to the martial tread of southern chivalry. No less courtly than brave they now extend to you the hand of cordial greeting and hearty welcome.

Gentlemen, I hail your meeting in the capital of the grand old State of Tennessee, the home of the hero of New Orleans as peculiarly auspicious. We need a declaration of independence in American art and architecture. We need emancipation from the thrall of misty tradition and meretricious folly. What Jeffersonian hand will pen the immortal document? What Michael Angelo will lead us out of the crypts, castles and cathedrals of the dead past into the living present? I do not deny but that you have builded proudly in the past; you have written in stone the world's greatest epics, while your monuments, though in ruins, bear silent witness to splendid civilizations lying out in the vast shadows of time. Those were past masters who built the great pyramids of Egypt, or planned the cunningly-devised hanging-gardens of Babylon to please the voluptuous fancy of an Oriental queen. Later on, you covered Europe with monuments of your genius, until it reached the ultima thule of grace and beauty in the architecture of Greece.

But where have you wrought for the humanities? Where have you shot a ray of beauty through the homes of the humble? We want a new renaissance — a renaissance which will reach the homes of the millions, and bring the blessings of a higher life alike to king and cotter. Let me commend you to the fair Hygea, rather than the Moloch of pride. The æsthetic Greeks paid her divine honors because, perhaps, they recognized in her —

> "A perfect woman, nobly planned,
> To warn, to comfort, to command,"

a work of divine art, greater than the noblest temples.

Hygea became the Goddess of Health, and upon her altar we must pour libations of golden sunshine and pure air if we would make life happier, and death more remote. To you, gentlemen, we must look for better means of ventilation, and better provisions for preventing the ingress of noxious gases and germ-laden exhalations from trap and pit. What is gained by massive columns, storied walls or heaven-piercing spires if sewer-gas is brought into the house under the plea of convenience, for it will as surely work destruction in the palace as in the hovel; and I announce it as my deliberate opinion that disease and death will increase, *pari pasu*, with house connections.

We demand too much of the plumber when we ask him to prevent gas from flowing into a building when water may flow from it. Trapping is a fatal delusion. If we took no better precautions against burglars than we do against disease germs, our houses would be nightly ravaged. Circumstances often control the selection of the site for a building, but its sanitary preparation is as much the province of the architect as the design of the structure. Dampness is a prolific source of rheumatism, pneumonia and consumption, and, indeed, a general lowering of vitality. Our great mother, earth, breathes through all her pores like the mighty Leviathan, and her humid breath is laden with carbonic acid, the product of vegetable and animal decay, and myriads of microbes nourished in her fruitful bosom. These, impelled by the law of the diffusion of gases, rise into parlor, dormitories and auditoriums, and in contempt of all "pomp, pride and circumstance" do their fatal work.

Subsoil drainage to lower the water level, and stopping the earth's lungs beneath the house with asphalt or some other impervious substance, with plenty of air-space between ground and floor, will prevent a large per cent of fatal disease. How simple, how cheap, and yet how rare! Men generally prefer to gratify their vanity in decoration and display, ignorant or indifferent to the fatal consequences of a neglect to provide against the tireless wings of the invisible foe. The warning voice of the doctor has been unheeded, though an unselfish evangelist in the cause of sanitation. The architect must be the Moses to lead the people out of this bondage of death. When you have filled all habitations with floods of sunshine and pure air, and when you have removed all waste without the dangerous recoil of pestilential effluvia, it matters not whether you build with "bricks without straw" or marble from the quarries of Carara, you will have built for humanity.

In thus seeking to enrich your art with the highest utility, I would not detract from its beauty or sublimity. I know that a noble monument is at once history, prophecy and poetry, instructing, exalting, inspiring generations of men. The great soul of the artist is lighted up with the triple fires of poetry, beauty and infinity, and, whether thrown upon canvas or stone, cannot fail to lift the beholder to higher plains of truth and clearer perceptions of the divine. The great artist, the great architect, is not the product of any particular epoch. At no period in the world's history has colossal statuary reached such immensity and perfect harmony of design as the Bartholdi statue of Liberty Enlightening the World. Its only rival in antiquity, the Colossus of Rhodes, named one of the seven wonders of the world, is dwarfed in comparison with it. Standing on Bedloe's Island, lifting high above turret and dome its flaming torch of liberty, it will be a perpetual invocation to heaven for the universal freedom and brotherhood of man.

Go on, then, in your high mission of prophet, priest and poet; but pause sometimes to relieve the dark background of poverty with lines of grace and beauty. Again, gentlemen, let me offer you, hand and heart, a welcome.

REPORT OF THE NEW YORK CHAPTER, A. I. A.

To the American Institute of Architects: —

The New York Chapter has been chiefly occupied, apart from its routine work, with the consideration of the efforts which have been made in Congress, particularly by means of the Stockslager Bill, towards an improved system of Government architectural service. Communications on the subject from the Secretary of the Institute and the Boston Chapter were received, and at the New York Chapter meeting of March 11, Mr. Wm. A. Potter, practising member of the Chapter, Fellow of the Institute, and formerly Supervising Architect of the United States Treasury Department, was invited to submit, in the shape of a draught of a bill for Congressional action, the views which his official experience had led him to consider as best adapted for professional practice, and as a consequence for the public interests, in the matter of public architecture. The Secretary of the Chapter had some correspondence on the subject with Mr. Potter, who willingly agreed to give the Chapter and Institute the benefit of his experience, but the trustees of the Institute having taken the matter up, no further action has been taken by the Chapter.

In connection with the question of the ameliorative intervention of our society and its chapters in the methods of public architectural and building service, it may be remembered that in a number of previous annual reports made to the Secretary of the New York Chapter, mention has been made of its efforts to secure for the city of New York a better building law than prevailed. These efforts have in the year just closing met with measurable success in the passage at the last session of the State legislature of a law embodying many of the changes so long advocated by the Chapter, particularly those relating to the safe construction of theatres and their adequate protection from fire, a question of great importance in any large centre of population, and not least so in New York, where over two hundred

and nine theatres and cognate places of amusement of all grades are are nightly crowded with pleasure-seekers.

The newly-embodied ordinance relating to theatres form a large and important feature in the recently-adopted law, and are substantially those which were prepared eight years ago, after consultation with the New York Board of Fire Underwriters, by a committee of the Chapter of which Mr. R. M. Hunt was chairman. They were suggested by provisions for a similar end existing in Vienna, Austria, furnished by Mr. Nelson L. Derby, a recent addition to the membership of the Institute, who had just previously returned from his architectural studies in that city. An edition of the new law has been prepared by Mr. Wm. J. Fryer, a prominent iron-worker of New York, and at present an official in charge of the municipal buildings, which, with its several explanatory diagrams and annotations, can hardly fail to be the issue preferred by those mechanics who are more familiar with routine work than with technical formula expressed only in print, and it is largely owing to the energy and pertinacity of Mr. Fryer that final legislative action on the bill was not deferred till another session.

The Committee on Examinations of the Chapter have, under the law, made thirty-one surveys on unsafe buildings during the year.

At the meeting of January 14, Mr. E. T. Littell read a letter from Messrs. J. A. & W. T. Wilson, of Baltimore, members of the Institute, asking the assistance of the various branches of the Institute in obtaining all the information possible as regards judicial decisions within the territory of the United States bearing on the fees of architects, especially with reference to the rates embodied in the Institute schedule. The request is a familiar one to old officials of the Institute and its Chapters, and it is to be presumed not generally a welcome one, for the material is wanting to give a satisfactory answer to it. It would seem, therefore, to be quite desirable that a committee should be appointed to collate and tabulate for the use of the members of the Institute whatever authentic data on the subject it may be found possible to gather. The task, however, it may be safely assumed, would be no light one. It would, on the contrary, doubtless be found a very tedious, difficult, and in some instances at least an inconclusive, and, so far, unsatisfactory one, but if only partial success is achieved, it would obviously be well worth the time and trouble that it may be found possible to bestow on it.

At the meeting of November 12, of last year, a communication, accompanying a number of printed documents and pamphlets, was presented from the Secretary of the proposed London Exhibition in 1886, asking for the countenance and affiliation of the Chapter in the project. In accordance with one of its suggestions, Mr. Kendall, President of the Chapter, was at a subsequent meeting nominated for membership to the Secretary of the Exhibition, and was promptly elected to its General Council, as was also, shortly afterwards, another member of the Chapter.

The officers of the Chapter were, in pursuance of an old custom of the American Society of Civil Engineers, invited to its last annual convention, and President Kendall had the opportunity and pleasure of acknowledging in person this courtesy of our sister society.

The President of the Chapter has several times been called on to exercise, according to law, the functions prescribed to him in conjunction with the Presidents of the National Academy of Design and of the Metropolitan Museum of Art, to report on the artistic suitability of statuary for a place in the Central Park, and on the question of proper sites therefor. His qualified approval of the equestrian statue of the South American hero, Bolivar, now in place in the upper portion of the Park, aroused the ire of the editor of the *Studio*, a promising art serial recently started in New York, which led to some criticism in its pages, an explanatory note from the Secretary of the Chapter, and some pointed remarks in the *American Architect.*

It may be remembered that the last report made from the New York Chapter gave information that the Willard Architectural Commission, consisting of Messrs. N. LeBrun, Chairman, A. J. Bloor, and Emlen T. Littell, had received eight thousand five hundred dollars of the trust fund of about eighty thousand dollars, bequeathed by Mr. Willard to the Metropolitan Museum of Art for the expenditures of the Commission. This has been partially used to pay the expenses of their selector and purchasing agent, Mr. Pierre L. LeBrun, who has spent seven months in Europe in preliminary work for the Commission. The following graphic remarks from a preliminary report he has recently made to the Commission can hardly fail to interest and entertain you as much as it has them: —

. . . .

"Your instructions to me were, briefly, to lose no chance of investigation or of consultation with good authorities, and to select and purchase objects for the collection whenever immediate purchase seemed advantageous or desirable. To further guide me in this preliminary tour of observation, I had a thorough knowledge of the views of my late friend, Mr. Willard, acquired through conversations extending over many years, during which the formation of this collection was very frequently debated.

"Mr. Willard had travelled considerably, and was an enthusiastic admirer of the many great works of architecture he had seen abroad. He considered that art to be the most comprehensive of all the fine arts, and it was with the ambition of doing all in his power to cultivate and encourage a popular taste for it, to help such students as were unable to secure the advantages of travel, and to elevate the standard of American work by presenting choice selections of masterpieces in all styles, that he desired to found an historical architectural collection.

"He wished the collection to tell a clear, graphic story of the progress of the art, from the earliest period to the time of the Renaissance. No important type was to be slighted; neither was the collection to consist merely of fragmentary bits of detail. It should present all the distinctive styles in historical sequence, and in such manner, too, as to show their inter-relationships and transitions. It should comprise carefully-made, good-sized models of typical buildings, casts of door-ways and other minor architectural features, and a complete collection of casts of applied ornament, sculpture and architectural detail, sets of photographs, and plain and tinted illustrations or engravings.

"I reached England on the fifteenth of December last, and left it, returning on the twenty-fifth of June.

"During that time the principal cities and art centres of Great Britain, France, Italy, Germany and Austria were visited, and their museums, art-collections and typical buildings were carefully studied. Copious notes were made, and interviews were had with prominent museum authorities, archæologists, architects and others whose experience and opinion were valuable. It is gratifying to note the unanimity with which those gentlemen approved of the scheme of the collection, and of its practical value as an educating influence in art.

"The museums were studied from the double point of view of arrangement and of possible supply of material. I will first allude to the hints of arrangement. It is, perhaps, needless to preface this report with the statement that, among all of the museums visited, none were found to contain exactly such an architectural collection as Mr Willard contemplated.

"This was only what was anticipated, and the explanation is not difficult. When the older museums were planned, such schemes of classification and grouping as are occupying the minds of the advanced museum founders or curators of to-day were unknown; they were, in fact, impossible in the then condition of knowledge of the fine arts. On the other hand, the more modern museums, which, as a rule, are more scientifically planned and tell a connected story, are mainly devoted to sculpture, painting and the industrial arts, while architecture is comparatively slighted.

. . . .

"All that I saw of museums offered convincing proof of the supreme importance and value of a well-laid plan in the selection and arrangement of objects, and the Commission is to be really congratulated that starting on a perfectly clear basis, they can profit by the successes, the mistakes and the initiatives of similar undertakings abroad.

"An impression generally prevails in Europe that Americans are apt to do things in a hurry, and I was constantly reminded of the wisdom of deliberation, especially at the outset of such an enterprise. This caution is, in a measure, forced on the Commission, because of the limitation of funds and space at its disposal.

"I have not yet been able to make out the classified lists of objects in all styles which will form a basis of the work of final selection, but am now engaged upon them, with the help of my notes, price-lists and other estimates, and hope to have them ready soon for your inspection.

"From the lists it will be possible to select most of the objects required. There is an almost absolute dearth in the European museums of Egyptian, Persian and Byzantine architectural details. I believe that for those styles it will be necessary to get typical castings made directly from the buildings or monuments.

. . . .

"There will be difficulty in obtaining the scale models, which should form such an important feature of the collection. I spared no effort to find good examples already made and for sale, but with the exceptions noted in Appendix B, was unsuccessful. Such models are made usually to order, and, if properly made to a good scale, are expensive.

"I found scattered through various museums a number of models in plaster, wood, cork and stone, but the scale was, in most cases, too small, and they were not as accurately detailed as should be done for this collection; nevertheless, imperfect as many of them were, they seemed to be centres of attraction even when placed among more beautiful objects. Of course, among them are many which would be of value to the collection as minor illustrations, could they be cheaply reproduced; but, unfortunately, that is impracticable without taking apart the originals, and otherwise injuring them in a manner to preclude permission being obtained; so that it will undoubtedly be necessary to have your models made to order.

. . . .

"I did not purchase anything during this preliminary tour, for the reason that I found it unadvisable and even impracticable to do so intelligently until I had completed the general survey of the sources of supply of material and had collated all the notes and information thus acquired.

"In conclusion, this survey of the museums of Europe has only made more evident the great value of the undertaking initiated by Mr. Willard — I write *initiated* because although a fine display may be obtained with the money bequeathed, yet the field is so vast and constantly expanding, that to make a thoroughly *complete* exhibit of the architectural branch alone, of the plastic and constructive arts competent to rival the ambitious programmes initiated abroad would require several times the money at our disposal.

"Collections of casts are springing up in all the older communities, and they have a completeness and a unity not found possible in museums of originals. Such collections must undoubtedly in the future be the main dependence of our American fine-art institutions. For although much of value still awaits the spade of the archæologist, as has been proved by the recent finds at Cyprus, Pergamos, Olympia, Ephesus, Hissarlik, Mycenæ, Assos, and other places, and although archæological expeditions will undoubtedly be fitted out by Americans to the further enrichment of our museums, yet we cannot hope to stock them adequately with antiquities.

"Chances of acquiring valuable collections of originals are rare and will become rarer. The opposite may be predicted of casts. I believe when it is shown in the Willard collection what may be accomplished in this direction, that the practical sense and love of art among our rich

men will divert such a share of their wealth into this channel that an historical collection of plaster casts, both architectural and sculptural, will be made in New York City, which will eventually rank among the finest and most complete to be found anywhere. I am, gentlemen, very respectfully, your obedient servant, P. L. LeBrun."

As this report from the New York Chapter is made to all its sister chapters, as represented in the Institute, it need only be added to Mr. Pierre LeBrun's clear setting forth that if — noting the examples of the old world, where every great or even moderate centre has its own general art-collection for the instruction and delectation of its own residents and visitors — if other chapters, emulating the example afforded by the oldest chapter, desire to have an architectural collection of their own, they have only perhaps to watch their opportunities, and to exercise the public spirit and forecast shown by the Messrs. LeBrun, to win to their ends the liberal hand of some local Willard of their own. Respectfully submitted by

A. J. Bloor, Secretary.

New York Chapter, A. I. A., Bryant Building, 55 Liberty Street, New York, 20th October, 1885.

The following gentlemen were elected as officers of the American Institute of Architects for the ensuing year: —

President, Thomas U. Walter, LL.D., Philadelphia; Treasurer, O. P. Hatfield, New York; Secretary, George C. Mason, Jr., Newport, R. I.; Board of Trustees, H. M. Congdon, E. L. Littell, Napoleon LeBrun, A. J. Bloor.

Committee on Publications.—H. Hudson Holly, New York; T. M. Clark, Boston; Chas. Crapsey, Cincinnati; J. McArthur, Jr., Philadelphia.

Committee on Education.—Alfred Stone, Providence; Henry Van Brunt, Boston; Prof. N. Clifford Ricker, Illinois; Prof. W. R. Ware, New York; T. M. Clark, Boston.

Secretary of Foreign Correspondence.—W. L. B. Jenney, Chicago.

At the banquet given to the Institute by the Art Association and other prominent citizens of Nashville, attention was called to the interesting facts that the Convention, which had that day been held in the Senate Chamber of the State Capitol, had assembled over the remains of its architect, Strickland, to whom a mausoleum in its precincts was at his death decreed by the Tennessee Legislature: that Thomas U. Walter, architect of the National Capitol at Washington, and that day reëlected President of the Institute, was the pupil of Strickland; while at the banquet table sat Napoleon LeBrun, architect of the Masonic Temple in New York, and of the Catholic Cathedral in Philadelphia, who was a pupil of Mr. Walter, and with Mr. LeBrun sat his own pupil and son Michael LeBrun. So that four successive professional generations were thus represented, in body or spirit, at this first convention of the Institute in the sunny South — beyond Baltimore and Washington.

THE ILLUSTRATIONS.

STATION OF THE N. Y. C. & H. R. RAILROAD, SCHENECTADY, N. Y. MESSRS. R. H. ROBERTSON AND A. J. MANNING, ARCHITECTS. NEW YORK, N. Y.

The materials used in this building are brick and terra-cotta, the roof being covered with red Akron tiles.

ALTERATIONS OF THE HOUSE OF J. H. MCAVOY, ESQ., CHICAGO, ILL. MESSRS. ADDISON & FIEDLER, ARCHITECTS, CHICAGO, ILL.

CHURCH DE LA CRUZ, QUERETARO, MEXICO.

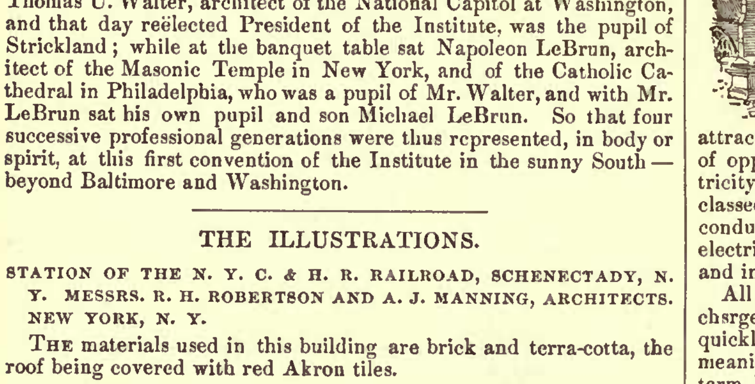
For description, see the article "Strolls about Mexico" elsewhere in this issue.

CHARTRES CATHEDRAL FROM THE SOUTH-EAST. AFTER AN ETCHING BY DELAUNEY.

MAISON DE LA PUCELLE, ROUEN, FRANCE.[1]

TEMPLE EMANUEL, NEW YORK, N. Y. MR. LEOPOLD EIDLITZ, ARCHITECT, NEW YORK, N. Y.

[Gelatine Plate, issued only with the Gelatine Edition.]



ON THE PROTECTION OF BUILDINGS FROM INJURY BY LIGHTNING.[2]



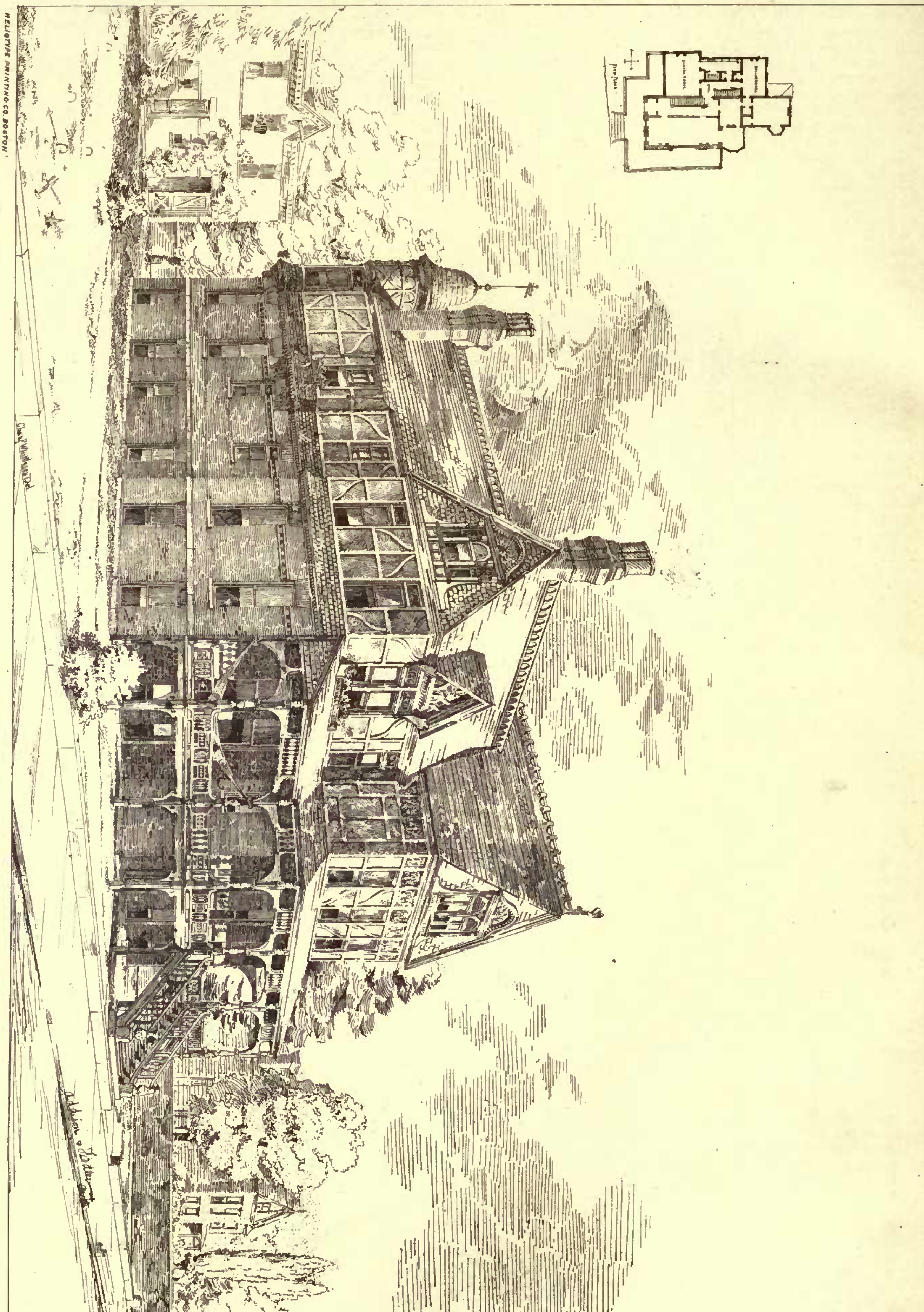
A LIGHTNING-ROD, or, as it is more commonly called, a lightning-conductor, is a familiar object to most persons; but the scientific principles upon which it is constructed are perhaps less generally understood, and as it is of the utmost consequence that those who are concerned in the erection of these rods should be acquainted with these principles, I shall, I hope, be excused if I commence my paper with a brief recapitulation of the leading points which ought to be borne in mind. Electricity is divided into two classes, called, for convenience sake, positive and negative electricity. Electricities of like name repel one another, and electricities of opposite name attract one another, and there is always a tendency for electricities of opposite name to unite. All substances are conductors of electricity, but in such widely different degrees that they are usually classed under three heads; viz., conductors, semi-conductors, non-conductors or insulators. Conductors are those bodies which convey electricity freely; semi-conductors are those which conduct badly; and insulators are those which scarcely conduct at all.

All materials can conduct electricity; *i. e.*, can accumulate a charge on themselves. The better conductor a material is, the more quickly can it collect electricity. It is important to understand the meaning of electrical potential. The following explanation of this term has been given by Silvanus Thompson: "A given quantity of electricity will electrify an insulated body up to a certain potential (or power of doing electric work) depending on its capacity." Bodies are said to be in electrical equilibrium when there is no difference of electrical potential between them. Generally all clouds are electrified, sometimes positively and sometimes negatively (Ganot, "*Physics*." 968). With these fundamental principles before us we shall be prepared to understand the theory of the accidents which we desire to prevent.

Just before a building is struck by lightning there has been an accumulation of electricity on the ground adjacent to the building, generally caused by a cloud charged with electricity of opposite name passing over, and occasioning (by a process which is called induction) a condensation of electricity upon it. The exact moment at which lightning strikes is brought about when the charges on the cloud and earth have accumulated to so great an extent that the air, or other non-conductor that may be between them, is no longer able to resist the strain put upon it. The electricities then suddenly unite by bursting their way through this non-conductor, and it is this sudden union which we call lightning. If, then, we can prevent a charge accumulating to any great extent on the ground adjacent to the building, we shall also prevent the conditions necessary for the discharge of lightning from taking place. Now this can often be done by causing the electricity to leak off as quickly as it accumulates, and to do this use is made of what is known as the action of points. This is as follows: When an insulated conductor is fitted with a sharp metallic point, it is found impossible to charge it with electricity to any great extent. The reason of this is that as fast as electricity is imparted to the body it leaks off into the air from the point; for when electricity is imparted to a conducting body it does not spread itself uniformly over its surface — and it should be remembered that a statical charge only resides on the surface of a conductor — but becomes densest where there are any prominences or angularities on the body, according

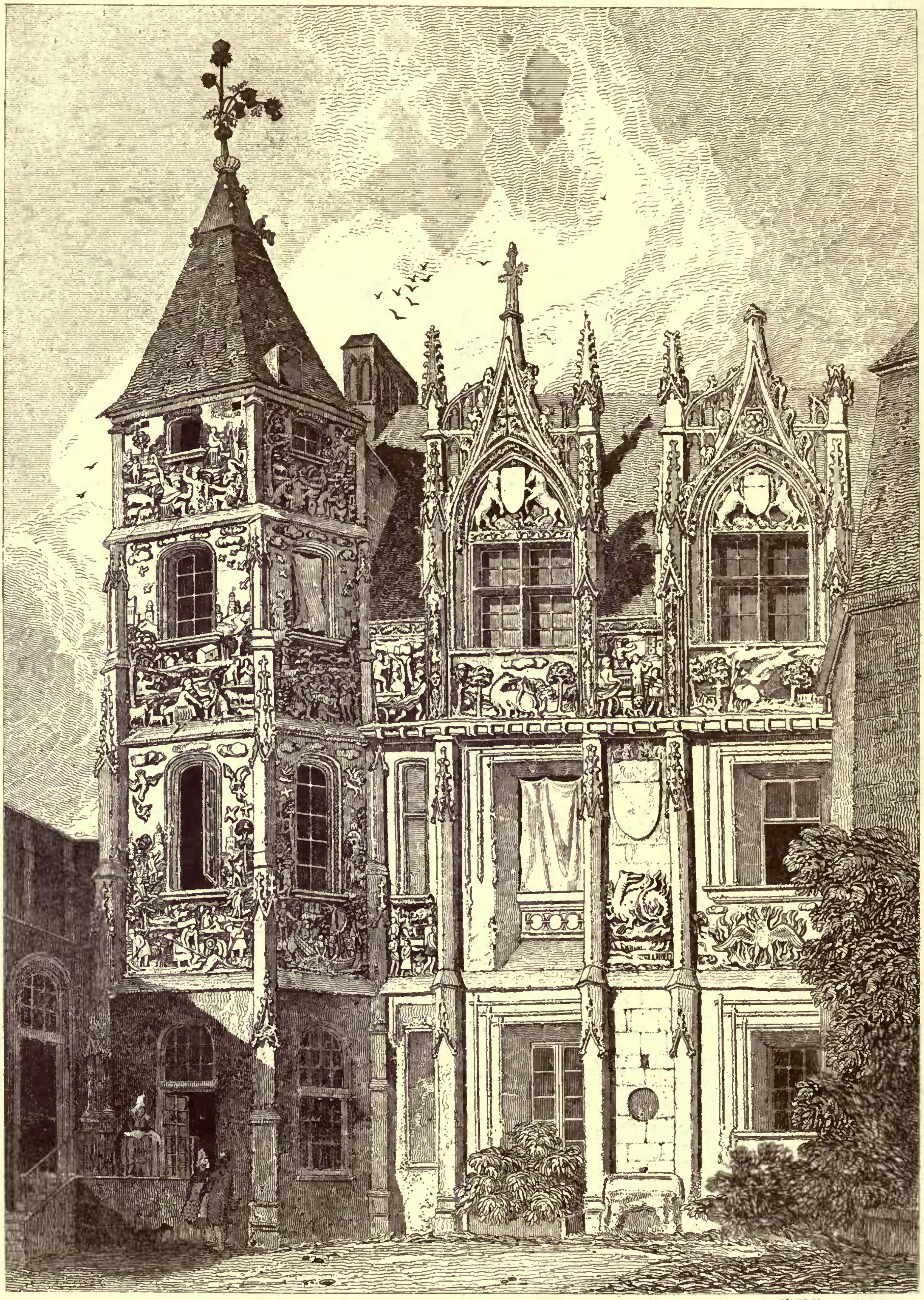
[1] From Cotman's "*Antiquities of Normandy*."

[2] By Basil Fenwick Howard, Electrical Engineer. A paper read at the Conference of Architects at Plymouth, England, September 2, 1885.



ALTERATIONS of RESIDENCE for J. M. McAVOY, Esq. CALUMET AVE. CHICAGO, ILL.

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HOUSE IN THE PLACE DE LA PUCELLE, AT ROUEN.

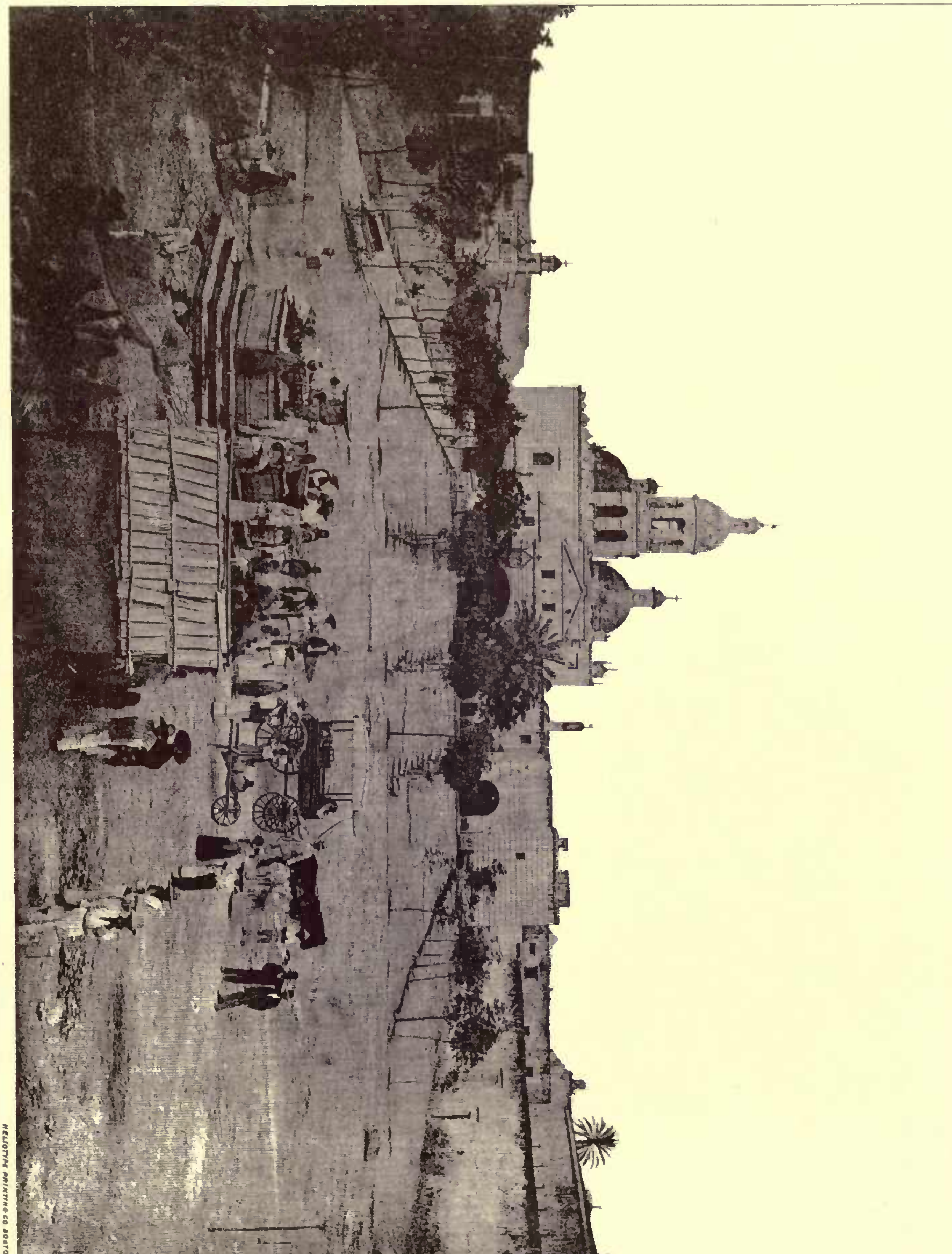
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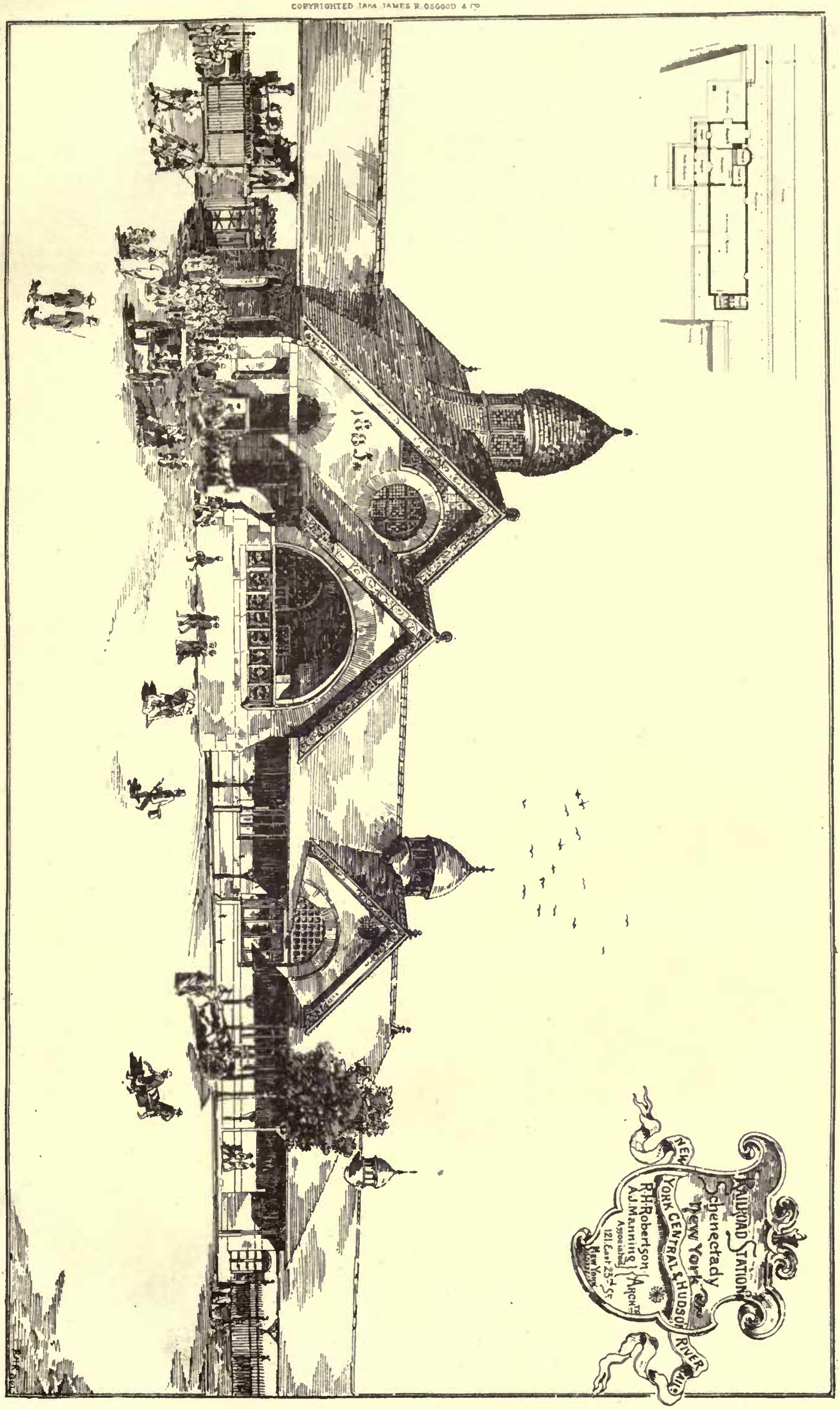
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to their size and shape, and in the case of a sharp point the charge becomes so dense as to be no longer able to remain there, but electrifies the adjacent particles of air, which it repels from itself. These particles carry away the charge which is upon them, and fresh ones take their place, and the same thing occurs so long as there remains any charge on the body. Thus the point quietly and harmoniously discharges the electricity of the body.

There is another way of preventing a great accumulation of electricity on the ground around the building, namely, by lessening its collectivity as much as possible. This is, however, in practice a difficult thing to do; but much can be done by not increasing its collective qualities, *i. e.*, by not putting any very collective bodies, such as metals, wood, etc., upon it, for metals are very good collectors of electricity. The enormous collective quality of iron, *e. g.*, as compared with other substances, may be seen by the following figures: It is 240 times more collective than any non-metallic substance, 533,000 times more so than sea-water, 7,500,000 times more so than spring water, rain, human beings, animals, wood, stone, brick, etc.; and 340 trillions of times more so than air, asphalt and glass (Parnell, "*A. of L.*," p. 174). Therefore, if we had to consider only danger from lightning, we ought to avoid as much metal, especially large metal surfaces, as possible in the construction of buildings.

There is also another reason why metal should be used as sparingly as possible in the construction of buildings, especially in high places, and this is, that since metals are such good conductors, lightning would seek them on its way to or from the earth, thus striking the building, which it would probably not have done had the metal not been there. Indeed, there are cases which show that even the gilding of picture-frames has been picked out by lightning for its path.

It may be objected that buildings made entirely of metal, such as iron churches and iron ships, are seldom, if ever, struck; but this is probably owing to the amount of leakage that takes place in consequence of the number of angularities and sharp edges which invariably exist on these buildings. When lightning passes through a good conductor of sufficient size, damage is only done at the place where it enters or leaves, *i. e.*, where it encounters resistance: therefore, if it be desired to convey lightning harmlessly from one point to another, a continuous conductor of sufficient size must be provided. It is found impossible to electrically affect the inside of a closed conducting body from any external source; and Professor Clerk Maxwell has proposed to protect buildings by covering them on the exterior with a network of wires (Silvanus Thompson, E. L., in "*Elect. and Mag.*," 32).

From what has been said above, it will be seen that the function of a lightning-rod is two-fold. Its first and most important function is that of causing any electricity that may accumulate on the adjacent ground to leak off quietly and harmlessly into the clouds that are charged with electricity of opposite name. A lightning-rod thus tends to maintain electrical equilibrium between the earth and the clouds, and so to prevent a disruptive discharge between these bodies.

The second function of the lightning-rod is that of carrying away any disruptive discharge that may fall upon the building to which it is attached, and (so to speak) conveying it harmlessly to the earth. It may be urged that when a lightning-rod properly discharges the first-named function, no disruptive discharge should ever take place. It does, however, sometimes occur, and may be accounted for by an accumulation of electrical charge on the ground adjacent to the building being so rapidly made that the rod cannot eject it fast enough. The difference of potentials between the clouds and the earth thus become so great as to cause a sudden explosion. The conditions, therefore, to be fulfilled in order that a lightning-rod may be efficient are these: First, "That its apex be a fine point elevated above the highest point of the building." (Thomp. 305.). Secondly, "That the 'rod' between the apex and the ground be perfectly continuous and of sufficient conducting power." (Thomp. 305). Thirdly, That "all metal surfaces, whether of lead, copper, or iron, in ridges, roofs, gutters, or coverings to doors or windows, should be connected with the conducting system." (*War Office Instructions* in *Par.*, p. 71 and p. 72.) Fourthly, "That its lower end passes either into a stream, or into a wet stratum of ground." (Thomp., 305.). In fact, what is to be aimed at is to cover the building to be protected with a sort of metal-work shield, which has sharp points on its highest parts, and which is electrically connected with the earth. This last is technically called making *good earth*. I shall now endeavor to point out how these conditions should be fulfilled, and the method of constructing a means of protection on these principles.

A lightning-rod consists of four several parts: the point or points, the terminal-rod, the stalk, and the earth-connection. As regards the first of these parts, the main condition to be observed is that the point must be sharp, because the rapidity of the escape of electricity depends upon its sharpness. However, if the point were made as sharp and as thin as a needle, which would be theoretically the best form to give it, it would be apt to be rapidly worn away by the weather, etc. Therefore the plan now generally adopted is to make the point sharp at its extreme end, but rapidly to widen out, so as to have plenty of substance of metal.

The points used in this country are generally made at an angle of about thirty degrees, and several metals have been employed as the material for them. First iron was used, gilded to prevent rust; then gilt copper came into use; and lastly, pure red copper, platinum, or silver alloy. The object of using platinum, silver alloy and gilding is of course to prevent the points becoming worn away by the atmosphere, etc.; but as these are all more or less costly, I would submit that if the point is in such a place that it may be easily got at to be cleaned and sharpened occasionally, a pure red copper point is perhaps the best, unless some corrosive gas is present, such as is sometimes given off by the chimneys of factories. In a case where the point cannot be got at, or when it is likely to be acted on by any corrosive gas, a platinum point is probably the best. Nevertheless, it is important to bear in mind that the point must be kept sharp.

Sometimes a single point is used, and sometimes a cluster of points. The single point possesses some advantages over the cluster in that it is less costly, and probably as good, provided it is kept sharp; also that it is less unsightly, and there is less exposed elevated metal. The advantages claimed for the cluster of points are that, should the points become blunted, the combined action for the cluster will equal that of one sharp one, and that one at least of the points will present itself more or less directly to any storm-cloud that may be approaching from any direction, owing to the divergence of the points.

The terminal-rod is the rod which projects above the building. The point or points should be screwed into the top of this rod, and soldered with good strong solder. And here I would observe that it is most important that all joints should be well soldered, for if this be not done rust will be formed at the contact of the two metals, and will destroy the continuity of the conductor. The importance of this is shown by the number of accidents that have happened where chain conductors have been employed. It may be well to mention also, that where practicable, rosin only should be used to make the solder flow; for if spirits of salts, etc., be used, corrosive action may take place at the joint, and thus interrupt the continuity of the rod.

As to the height that this rod should rise above the highest point of the building, in most cases it should not be above five feet, as a visual examination of the point might then be made. The reason why rods have sometimes been carried to so great a height above buildings is owing to a generally accepted theory that a rod protects a conical space whose apex is the top of the rod. "The radius of (this) cone," says Mr. Preece, "should be taken (as) half the height of the conductor" (Preece, 348 in Parnell), which gives the base of the cone equal to its height.

We now come to the stalk of the lightning-rod, or that part which runs from the terminal-rod to the ground. In this country the material most commonly employed for this purpose is copper; but iron has been also used, and in France and America iron is usually employed. (Anderson, in Parnell, 129, 132, 134.). It is somewhat cheaper than copper, but is much more liable to rust; and again, iron rods, to have the same conductivity as copper, must be much thicker, causing the rod to become very unsightly. There are two kinds of copper rods now generally used in this country; the one copper rope, made of several strands of copper wire twisted into a rope, and the other a tape of copper. The tape form is probably the better, because it is much less likely to be corroded by damp, etc. If copper rope is used it should be made of very thick wires, for a group of small wires exposes a larger area to the risk of corrosion (especially if damp should get into the interior of the rope), and, consequently, would be more liable to be destroyed. The Report of the Lightning-Rod Conference of 1881 states that copper is the best material for rods, and recommends a copper rope one-half inch in diameter, or a copper tape, the dimensions of which are three-fourths of an inch by one-eighth inch. But a rod should be of larger sectional area in proportion to the height to which it is carried (Harris, as quoted by Par., p. 53). A rod of too small a sectional area should never be erected, as it is open to the risk of being fused should lightning strike it.

The stalk being well soldered to the terminal-rod, should be carried outside the building, and as straight as possible to the ground. It should not be carried near to any small gas or water pipes, as they might be fused if lightning were to pass through them. All masses of metal, whether on the outside of the building or inside, especially those which are near to the outside walls, should be metallically connected to the stalk; for if this be not done, there will be great danger of lightning, if it strikes the rod, leaving it to pass to the earth by any metal that may be near.

It has been remarked by Arago that "lightning seeks out by preference metallic substances, whether external or concealed, which are either at or near the point towards which it falls, or near its subsequent serpentine course" (Arago. Met. Ess. in Parnell, 139). An allowance should be made for the expansion and contraction of the stalk, as otherwise the holdfasts may be pulled out of the wall to which it is attached and joints be broken. In France sometimes a compensator is used for this purpose. It is a semi-circle of red copper; the stalk is divided, and the ends are connected to this compensator — it is, in fact, a bulging-out of the stalk. This compensator is usually made three-fourths of an inch wide, one-fourth inch thick, and twenty-eight inches long or more (Anderson, *Lig. Cond*). If copper is used for a lightning-rod, care should be taken that it is of good conducting quality. To secure this there should be about ninety-three per cent of pure copper in it. The supports for the rod should be made of the same metal as the rod itself, for if a dissimilar metal be used, and moisture get in, a galvanic action will be set up, accompanied by rapid corrosion. Insulating supports should not be used, as is sometimes the case, as they are perfectly useless and costly. The whole of the rod, except the point or points, should be tarred or painted. This would tend to preserve it, and it would not be so

unsightly, as it could be made to match the stone-work, etc., that it is put against.

We have now arrived at perhaps the most important part in connection with the rod; viz., the earth-connection. It is absolutely necessary that there should be a thoroughly good electrical connection between the rod and the earth, in immediate proximity to the building; for success in the protective efficiency of the rod depends in a very great measure on this. Mr. Anderson remarks that "probably in nine cases out of ten, wherever a building provided with a conductor is struck by lightning, it is for want of a good earth." (And., 198.) He also says that "to dwell too largely upon the importance of leading all lightning-conductors down into moist earth, or, as it is commonly called 'good earth,' would be scarcely possible." (And., 198.) Also, "as regards the means of obtaining a good earth-connection, the first, and in all cases most preferable, is to lay the conductor deep enough into the ground to reach permanent moisture." And again, when the quantity of moisture is deficient or doubtful, it "will certainly be advisable to spread out the rope," or conductor, "so as to run in various directions, similar to the root of a tree, likewise in search of moisture." (And. in Par.) And that, "to protect any structure of any great extent, it is absolutely necessary to bring the conductor or conductors deep enough into the earth to reach water." (And. in Par.)

The War Office recommends that not less than thirty square feet of metal should be in contact with moist earth. (W. O. Inst. in Parnell, 1875, 4.) Also that "all large systems should have several earths, so that, should one be defective, the discharge may be effected through the others." (Do.) And that "if the soil is dry, radiating trenches should be cut thirty feet long, and eighteen inches or two feet deep, and that the conductor itself, or old iron chain carefully connected to its foot, should be laid therein, and that the trenches should be filled to a depth of twelve inches with coal, ashes, or other carbonaceous substances." (Do.) Also that "surface drainage should lead over the trenches." (Do.)

The use of iron as an earth connection for a copper rod is objectionable, because galvanic action will be set up, which will cause the iron to corrode. A copper plate well-soldered to the copper conductor is the best form of earth-connection. The joint of these two should be well tarred to prevent moisture from destroying it. Gas and water pipes may be used if not too small in diameter, and if not made of soft metal, as auxiliary earths; but they should not be trusted to alone. Earthenware drains should never be used, as they make very bad earths. Coke is a good conductor, and should be used with earth-plates, etc., as it tends to prevent the metal from corroding.

When a current of electricity passes through a liquid, other than a liquefied metal, it decomposes it, and in the case of water sets free the two gases, oxygen and hydrogen. Now, as there is always more or less a current of electricity passing through a lightning-rod, it decomposes the water at the earth connection of the rod, and sets free oxygen or hydrogen, as the case may be, at the earth-plate. Which gas is given off at the plate depends upon the direction of the current. If oxygen is given off at the plate, it oxidizes it, and so tends to destroy it. If, on the contrary, hydrogen is given off, then a deposit of hydrogen is formed all over the plate, and this causes the electrical resistance of the earth connection to be very much increased, for hydrogen is a very bad conductor.

The best and perhaps the only way to get over this important difficulty is to expose a large surface of conducting material to this action. We next come to the question of how many rods it is advisable to put on a building. The following instructions are given by the War Office (in Parnell, 1875, 5–8): A building of uniform height should have a pointed rod five feet above it at intervals of forty-five feet along its length. If of iron, the points should be gilt. (W. O., 29.) Buildings not more than twenty feet long to have one vertical conductor at the end, with a point five feet above the roof, and a horizontal conductor along the ridge. (Do. 30.) If twenty feet to forty feet long, there should be one vertical conductor in the centre, with a horizontal conductor along the ridge. (Do. 31.) If exceeding forty feet long there should be two vertical conductors, and if exceeding one hundred feet, three. (Do. 32.) All parts of a building of marked elevation should be fitted with conductors. (Do. 34.) Where several conductors are used in a building they should be connected horizontally. (Do. 35.)

With reference to horizontal conductors, it may be well to mention here that if ornamental metal-work ridges be put on roofs they could be, if of adequate size and so connected as to be really continuous, used as horizontal conductors, thus reducing expense. When a lightning-rod is attached to a tall chimney, the ironwork of the furnace should be metallically connected to it, and at the top of the chimney a band of copper, in metallic connection with the rod, should be run round the top of the sooty lining of the chimney. The reason for doing this has been given as follows: smoke, flame and heated air are good conductors of electricity; and as these are usually coming out of a chimney and ascending high into the air, lightning may strike them, and if the wind is blowing this column away from the terminal rod, it would lead to the sooty lining, which is also a good conductor; but this band of copper intercepts the lightning, so to speak, and carries it to the lightning-rod.

It has been suggested that a small town-house might be well protected by using the rain-pipes as lightning-rods. They should, of course, be connected with the earth, and all the joints should be metallically made by soldering a strip of metal across the ordinary joint. An iron rod should be carried from the pipes to the highest point of the house, and of course a sharp point put on the top, and all metals connected to the pipes. This would not cost very much, and would probably be a good means of protection. Laborers' cottages in the country, which appear to suffer so much from the effect of lightning, might be treated in the same way, if fitted with rain-pipes.

"Volta thought large fires would prevent thunderstorms." (Ar. in Parnell, 212). And "at Caserna, in Romagna, by the advice of the curé, the inhabitants, on the approach of thunderstorms, used to place heaps of straw and brushwood at about every fifty feet, and set them on fire; and for three years they experienced no thunder or hail." Probably the reason of this is that the smoke, etc., which rises carries with it the charge which it has acquired from the earth, and rising with the atmosphere, tends to maintain electrical equilibrium between the earth and the clouds. This may be one of the reasons why towns do not suffer much from thunderstorms. Major Parnell has proposed to utilize this important property by turning the chimneys and grates on the lower floor of country houses into electric taps, as he calls them. "The proposed plan is merely to connect the grates by means of one or more iron bars to the ground below, and to fix on the grate a few short, sharp iron spikes" (Par., p. 278). These iron spikes would probably be found very inconvenient in practice, and I would propose that they be left out altogether, as I do not see that to dispense with them would at all impair the deficiency of the apparatus.

The inspection and testing of rods is a subject of the greatest importance. In this country the regular visual examination and electrical testing of rods appears to be almost entirely disregarded. Such a course is much on a par with the neglect of a periodical examination, testing, and cleaning of a steam boiler, and we all know the danger of such neglect; nor where it is permitted can we be surprised if we hear of an explosion. In France, Germany, and other States of Continental Europe the periodical examination of lightning-rods has been practised for a long time past (And. 222).

At least once a year rods should be inspected by a competent electrician. The course of inspection should be as follows: 1. Where practicable, the points should be cleaned and sharpened if required. 2. Care should be taken to see whether there has been any great mass of metal introduced into the building since the rods were erected, and if so, it should be metallically connected to the rod. 3. The continuity of the rod should be ascertained to be perfect from the point to the base. This should be done by testing the electrical resistance of the rod, and to do this, in cases where the top cannot be reached, it has been proposed to run a loose wire by the side of the rod, with its upper end permanently soldered to the top of the rod, and its lower end brought within reach. This loose wire is of course to be connected with the rod at its lower extremity, and only to be disconnected for the purpose of testing. 4. The electrical resistance of the earth-connection should be measured. If this be found to be large, then the rod is worse than useless, for it then only tends to cause a discharge of lightning to fall upon the building.

In conclusion, then, let it be borne in mind that to make a rod efficient it must make unfailing electrical connection with the ground which is in immediate proximity to the building; that the continuity of the rod must be perfect from point to earth; that all masses of metal about the building must be connected with the rod; and that the point or points must be always sharp. Lastly, that unless these conditions be fulfilled, the rod cannot be depended on, and will then be a source of danger rather than of protection.

ROOF OF THE PARTHENON.



WHILE it is fair to suppose that comparatively few of the practical roofers among our readers are interested in classical topics, we still venture to present some particulars with reference to the roof of the Parthenon. This building was comparatively simple in its planning and construction, and yet the controversies which have arisen concerning its arrangement and finish are somewhat remarkable. Among them not one seems more far from solution than the question of roofing that part of the temple in which the statue of the godess was placed. Was the space left open to the sky in order that the figure might be fully seen? If so, must not the work of Phidias be injured, notwithstanding the mildness of the climate? If the space were covered, how was the roof constructed? Was it an awning of a temporary kind, which

was withdrawn whenever the weather was suitable? Or was the roof formed of translucent tiles of Parian marble? Was it a solid roof by which artificial illumination became indispensable, or was the solidity accompanied by a sort of clerestory which admitted a dim religious light, making lamps no longer a necessity? Such are a few of the questions which have been raised and supported by redoubtable champions.

M. Ronchaud, the Director of the National Museums of France and of the Archæological School of the Louvre, is the latest supporter of what may be called the theory of a temporary roof. Taking a passage in the "*Ion*" of Euripides as a clew, he maintains (in a book published by M. Rouam) that the statue of the goddess was protected overhead by a sort of canopy formed of tapestry, and that the *peplos* which the Athenian ladies were proud to produce was much more than a hanging that served as a background or a screen for the figure, and became a veritable tent. A similiar thought has crossed the brains of the other inquirers. Stuart noticed the passage on which M. Ronchaud relies, but he set no value on it. The conclusion by which he stood was that there were three divisions longitudinally in the Parthenon — that those at the sides were roofed, while the central part was exposed to the heavens.

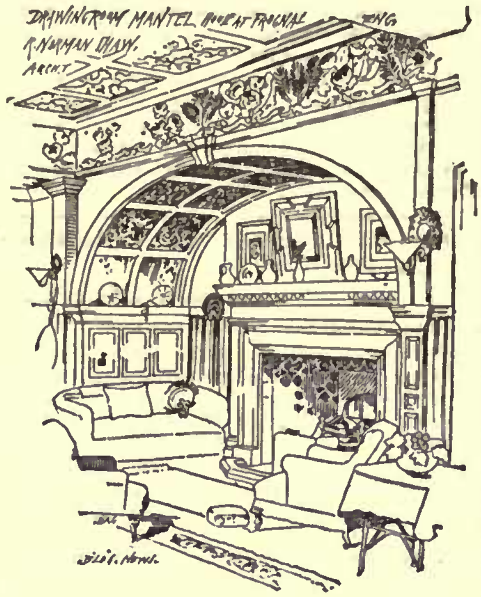
It is probable that Stuart and his *dilettanti* patrons set their faces against the passage, on the ground that there is nothing to connect the structure described therein with the Parthenon. The story of Ion, which was treated by Euripides, can be briefly described in the words of Talfourd, whose play on the same subject may have been seen by some of our readers: "A foundling is discovered by a mother, who had since married, to be her son, and is palmed off on her husband as the fruit of an early amour of his own, thus securing a wished-for happiness for Xuthus, an inheritance for Ion, and at once her child and her character to the mother." Ion has been brought up in the seclusion of the temple, which to him is the world. A work of this kind might, then, be supposed to be marked by local color, and to give as realistic a representation of the surroundings of the prince as would be compatible with the laws of dramatic poetry.

In the passage on which M. Ronchaud relies, we read of a young man raising with care, and by the aid of the columns, an inclosure which was to shield the temple both from the noontide rays of the sun and its declining beams. It assumed a rectangular form, with an area of about 10,000 feet, and from its size all the people of Delphos might have been invited. Having taken from the treasury the sacred tissues, he disposed them in pleasing draperies. He began by attaching to the roof one end of a *peplos* which had been taken from the Amazons, on which were to be seen representations of the celestial hosts. Then around the side he hung tapestries figured with naval combats, hunting scenes and the like, while near the entrance were placed those with the story of Cecrops. M. Ronchaud says that the description must have referred to some interior that was familiar to the audience. The poet begins by speaking of an improvised inclosure, but before he ends he talks as if it were a walled building. The sea fights may have been an allusion to the battle of Salamis, and the other subjects were no less suggestive to Athenians. The area of the enclosure has a relation to that of the Parthenon. The tent at Delphos has a length of one hundred feet, which corresponds with the length of the naos of the temple, and on that account it was known as the Hecatompedon: Plutarch describes the Parthenon as measuring one hundred feet every way, and the figures suggest a popular belief. M. Ronchaud doubts whether the peculiar dimensions of hundreds of feet could be equally applicable to any other building of that time.

It is next taken for granted that the reader will admit the use of polychrome decoration about the temple. The exterior was a mass of varied color, and as it faced the east it resembled a flower opening itself to the sun. But it may also be supposed that the interior glowed with color, and, as M. Ronchaud says, tapestry would form the natural complement of the decoration which surrounded the statue, and correspond with the richness of the figure of Minerva. When Plutarch is describing the trades that were employed under Pericles he includes gold-smiths, ivory-cutters, painters or picture-drawers, embroiderers, and turners; and Phidias no doubt was concerned in all their operations. M. Ronchaud follows the general belief that there was a double colonnade on three sides. Dodwell believed that he had fragments of the columns, soffits and compartments, in the beginning of the century. M Ronchaud supposes that tapestries were attached to those columns, and formed an inclosure or tabernacle for the statue. The battle of Salamis may have been represented on them, as described by Euripides, and there would thus be a correspondence between the struggles that appeared on the interior and exterior of the building. The poet speaks of work which was of a foreign origin, and he may have had Persian hangings before his mind's eye. The columns of the upper gallery would form a fitting place for them.

So far there would be nothing contrary to conventional ideas in the garnishing of the temple; but it is different when we come to the tapestry which is supposed to have been used as a substitute for a more dense kind of protection over the *hypæthros*. In the drama we read how a side of the *peplos* was attached to a roof. M. Ronchaud is of opinion that the roofing of the side aisles of the Parthenon should be taken as the supports, and the *peplos* would thus become a sort of awning, on which the representations of the figures of the sun, moon, planets and stars would be fully appropriate. The objection that naturally arises on reading the suggestion is that tapestry could not be impervious. In proportion to its thickness would be its slowness in drying, and a dripping roof is not conducive to reverence. M. Chipiez, the architect, opposed the scheme on grounds of the kind. M. Ronchaud does not, to our mind, overcome the objection. We admit to him that the climate of Athens was generally fine, and that it would be possible to remove the tapestry whenever it was in a state that allowed the rain to pass through the pieces, although it would be no easy affair to pull heavy tapestry about in such a position by manual labor. His reasoning would be, we consider, much more applicable to the arrangement proposed by Dr. Fergusson, whose book on the lighting of Greek and Roman temples seems to have escaped M. Ronchaud's notice. In it the *peplos* is supposed to be utilized as a canopy over the figure of the goddess, and to be suspended from the roof, but it is not from aisle roofs, forty feet apart. Dr. Fergusson's restoration allows tapestry to be used to a large extent, and there is nothing in it which is opposed to the description of Euripides, supposing that the latter does relate to the Parthenon. — *The Metal Worker.*

ASBESTINE PLASTER.



WITHIN a few years during which great activity has been displayed in inventing and developing new methods of construction and new building appliances of all kinds, particularly all that relates to fire-proof building, more or less attention has naturally been given to cements, mortars and plasters, both in the endeavor to produce materials having new chemical combinations, and new methods of applying the familiar materials. In the first list may properly be included asphalte, the many new and improved brands of Portland cement, Ransome's cement, hydraulic lime, soapstone finish, and so on, each of which have invaluable properties when used at the right time, and in the right way. In the second class may be ranked Hyatt's employment of iron and Portland cement in combination for flooring; the use of wire-lathing in its several patented developments, and the various kinds of fibrous mixtures used for internal plastering.

Of methods perhaps the most novel, as it is the most useful because of its great applicability, is the wire-lathing, which seems to approach more nearly a really new discovery than the others; while as an absolutely new material the new Robinson cement, described in these columns a short time ago, seems to have more valuable properties than the others.

When a new material or a new method of applying an old one is discovered, it always seems strange that we were content with such clumsy methods as those just superseded. Common lath-and-plaster still wins nine times out of ten in the struggle with wire-lath, but when it has to contend with a method and material which at the same time economizes space, is fire-proof, water-proof, and offers a surface of almost impenetrable hardness, and which because of the less amount of material can hold its own under not too great a disadvantage in point of cost, the number of times lath-and-plaster will win, and by the victory retard the progress of good building, must steadily diminish. A plastering material which is not excessively costly, which does not require any key to hold itself in place, which can help to make a room fire and water proof seems to be too valuable a material to a profession whose object it should be to introduce and encourage the use of whatever conduces to permanency in building for us to hesitate to speak of it, even if it be new, almost untried and — patented. To our minds, if the question of possible deterioration of the material during a prolonged storage after manufacture can be satisfactorily disposed of, the Merritt Asbestine Plaster promises to be an unusually valuable building material, upon the many possible applications of which it is unnecessary to dilate.

As its name suggests, one of the forms of asbestos is a main ingredient in the mixture, while silicate of soda and potash are other components, which is put up in barrels in the form of a semi-fluid paste ready for mixing with sand — no lime, hair or other fibrous material being needed: it is therefore in a most portable shape, ready for almost instant use as soon as delivered at the building, so that obvious economies in time, space and labor are suggested over the common method of slacking, mixing and stacking ordinary lime-and-hair plaster. As the material hardens to the consistency of stone, and has extraordinary adhesive and cohesive properties, it can be used to

advantage at points where Portland cement is now used — in topping-out chimneys, in weather-pointing, in laying the walls and floors of safe vaults, and so on.

But its chief merit lies in its use in combination with iron. A room lined with iron is fire-resisting, but a room lined with iron and Merritt's Asbestine Plaster should be — if laboratory and experimental tests may be trusted — fairly fire and water proof. Nothing extraordinary in this, it may be said, when iron alone so nearly possesses these qualities when used of sufficient thickness; but there is something extraordinary in it when the iron is ordinary, thin, smooth sheet-iron, tacked up against the studding and treated only with a coat of rust-preventing paint, which also serves the purpose of a slight cement over the lap-joints of the iron sheets, and the plaster, applied; in the usual way, is or may be a mere skim-coat, three-sixteenths of an inch thick, or more as desired, clinging to the smooth surface so that it can only be cut off with a cold chisel, and protecting the wood-work behind against the fiercest laboratory tests. This it does when applied to plain sheet-iron, but as this is of course of no great stiffness, and is liable to buckle under variations of temperature, the patentee proposes to use a sheet with corrugations about one-eighth of an inch in diameter, thus making possible the use of very thin and light iron. Applied in this manner between floorings, a water-proof floor would be obtained which would greatly lessen the terror that fires now have to owner and underwriter; while the plaster alone is said to be more impenetrable by water than ordinary plaster, and would probably, for a considerable space of time, protect a lower story from flooding. The material, though a new one, is already in the market and can be seen in use at the Hotel Warren, the Boston Safe Deposit and Trust Company's vaults, and the new addition to the Parker House, all in Boston.

MORE SUGGESTIONS FOR THE GRANT MONUMENT COMPETITION.

Philadelphia, Oct. 20, 1885.

To the Editors of the American Architect: —

Dear Sirs,— Having become acquainted with the system of competitions now adopted in France, and more particularly in the Beaux-Arts, I have followed with great interest the various suggestions made to govern the competition for a "Grant Monument." I think any one who has gone through a competition himself, and is desirous of seeing the best result attained, will endorse the main points given in your paper of the 10th inst., in a letter signed, J. W. Yost: That there certainly should be at least two competitions, and the first one open to all.

The most serious difficulty, I see, is the selection of a suitable jury. Supposing the best ten architects in the country were to enter the competition, you then exclude from the jury the ten men best qualified to give an opinion, and the difficulty is increased when a choice is to be made for the second jury.

Regarding the number of aspirants selected from first competition to take part in the second, I think it a mistake to limit it to ten. I would rather see fifteen allowed the chance, or else leave it optional with the jury to select not more than fifteen, nor less than ten, according as they deem them deserving. If we had one recognized "style" of architecture here it would be different, and ten drawings, differing more in *detail* than in style, would be enough to enable the jury to make a selection; but where we should be likely to have repeated examples of half a dozen totally different types of architecture, I think the collection would prove of greater interest, permitting, as it would, the chance of two or three sketches of every good and appropriate style, enabling the jury to make a more comparative examination. The following suggestions seem to me fair, differing slightly from those already alluded to: —

Two Competitions: — First competition open to all. Time, three months; requirements, plans, elevations and sections at a small scale, say one-sixteenth inch, to be rendered in colors or ink, jury to consist of ten architects (I see no need of having others than architects on this jury, since the drawings, at such a small scale, would give little opportunity for detail work, and ought to be treated more as a mass or motive, than as a bit of execution); the jury to be appointed by the Monument Committee upon completion of drawings; all drawings to be exhibited under a *nom de-plume;* compensation, $1,000 to each of the fifteen or ten (as may be selected) receiving the highest number of votes.

Second Competition open to the fifteen or ten premiated designs. Time, six months; requirements, one-quarter-inch drawings of plans, elevations, sections and specifications, with guaranty that it can be executed for the sum specified; jury to consist of ten architects and five sculptors, to be appointed by Monument Committee. No juror to sit on both juries, or to compete, in any way, for the competition, *nom-de-plume* to be changed from first competition, and the jury appointed upon completion of work.

Compensation: First prize, execution of the work at usual commission; second prize, $5,000; third prize, $3,000; fourth prize, $2,000; fifth prize, $1,000.

To my mind the great difficulty lies in the selection of a capable jury, and I trust your paper will be the means of ventilating thoroughly the subject.

I am, very respectfully yours,

Un élève a l'Ecole des Beaux-Arts, Paris.

BED-BUGS AND HEMLOCK TIMBER.

To the Editors of the American Architect: —

Dear Sirs,— Are you able to pronounce as to the truth of the assertion that the use of hemlock timber in houses is apt to subject them to the annoyance of chintzes or bed-bugs? Your dictum on this point, through the columns of your paper, will oblige,

Respectfully, T. C. K.

[We do not know that bed-bugs are peculiar to hemlock more than to other species of pine, and we do not believe that architects need hesitate to use the timber in its dressed form. But we do know that the insect is, so to speak, a wild monster and not necessarily an adjunct of civilization, since we have known it to present itself in force in the new hut of a mining engineer — of whose personal habits and the cleanliness of whose luggage there could be no question. In this case, the hut was builti n part of logs with the bark on.—Eds. American Architect.]

NOTES AND CLIPPINGS.

Temple Bar. — Old Temple Bar, London, is to be reërected in Battersea Park by the Albert Palace Company. The Albert Palace is a new place of amusement contiguous to the park.

Scientific Intolerance. — In the new Physiological Museum, which has just been crected in Oxford, it is reported that the eminent scientists have refused to allow the university, motto, "*Deus illuminatio mea,*" to be inscribed on the walls.

Fresco discovered in the Cathedral of Graz, Styria. — A fresco was lately discovered by workmen engaged in restoring the cathedral of Graz, the chief town of Styria. It was simply walled up by a monument erected to a bishop who died in 1570, and is in excellent preservation. It represents the crowning with thorns. The colors are almost fresh, and the figures admirably drawn. The date is assigned to about 1460. — *New York Commercial Advertiser.*

The Straits of Northumberland Tunnel. — Experts who were sent to report on the scheme for connecting Prince Edward Island with the main land by tunnelling Northumberland Straits have reported favorably, and the work will soon begin. Senator Howland, who originated the idea, is here making arrangements with the government for a subsidy. Vernon Smith, a prominent engineer, will superintend the work, in connection with which he will leave immediately for New York, to make preliminary arrangements with capitalists of that city who are taking hold of the project. — *Exchange.*

Suit about a Chimney. — A dispute has arisen between the Bridgeport, Conn., Water Company and the Bridgeport Paper Company, regarding the ownership of a chimney which both have jointly used for many years. The paper company wish to pull down the chimney and build a larger one, and on Sunday they began to pull it down, but were restrained by an injunction signed by Judge Granger, of the Superior Court. The water company claim that they cannot do without a chimney, even for a single day, as more than 40,000 people depend upon the company for a supply of water. — *Scientific American.*

Artesian Wells in Tunis.—An account of the operations connected with the object of finding water in the desert tracts of southern Tunis has been given by M. Ferdinand de Lesseps at a meeting of the French Geographical Society. Two years ago he visited the region of the Tunisian Shotts, and while there he observed on the banks of the Wady Melah a lake in which the level of water never sinks. The water of this lake was excellent, and he inferred that the source of the supply was a deep underlying store of water. He therefore requested the engineers to make borings or to sink a well at that spot. Success rewarded the effort. At a depth of ninety-one metres the suspected sheet of water was tapped. The flood rushed from the ground with such velocity that it raised with it stones weighing twelve kilograms, and threw them to a great height into the air. This well yields eight thousand cubic metres of water per minute.—*Exchange.*

When to Plant Trees and Shrubs. — So partial are owners of small gardens to planting trees and shrubs in the spring, that it appears desirable to remind them now that the best time in the whole year for making alterations in plantation and shrubbery is the autumn. Evergreens of all descriptions may be most successfully planted in September and October, and deciduous trees and shrubs from early in the month last mentioned. Generally speaking, planting operations can be carried on with greater advantage in the autumn than in the spring. There is usually more time for the work, the ground is invariably in better condition, and the trees make new roots before the winter is far advanced, and are able therefore to make good progress from the moment of their starting into new growth in the spring. The fact should also be borne in mind that when the work is not commenced until after the end of the year there is a considerable risk of its being delayed by an unfavorable condition of the soil till late in the spring, with the result that the trees or shrubs suffer severely when the weather is either hot or dry during April or May. It will perhaps be useful to mention that all soils are much colder in the spring than in the autumn, and therefore much less favorable to the production of new roots by trees that have been transplanted. It is also worthy of note that at the nurseries purchasers in the autumn have a much greater choice than those who defer buying until the spring, for the quarters are then much thinned. Especially is it necessary in the case of fruit trees to buy in the autumn, for it is no unusual occurrence for the greater proportion of the more popular kinds to be sold out before the winter is far advanced.—*Amateur Gardening.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

TRADE REVIEW.

THE slight falling off in the demand for building material during the past thirty days has been due to two or three evident and reasonable causes, viz., the approaching completion of building operations, the decline in the number of new enterprises to be prosecuted this season, and the slight increase in prices in certain lines of building material. Taking the building-material market all through, however, there has been no advance, because there has not been the necessary increase in demand. It is generally conceded that fair activity will be maintained throughout the winter, but it is evident that builders are not anticipating probable requirements. The industrial situation has materially improved since September 1. Manufacturers are generally well employed — not only manufacturers of the cruder forms of material, but those of finished and construction work. Many manufacturers have done more work this year than last, while in some branches less has been done, but a correct appreciation of the developing tastes and requirements of the public seldom results in a decrease of work. A slight improvement in prices would be generally favorably regarded, for the greater confidence they would create, because of the presumed expansion of demand, based upon an enlarging consumptive capacity and purchasing ability of the country. Lumber of all kinds is in abundant supply, especially the hard woods, and a comparison of prices with former months exhibits but little variation, due doubtless to the observed fact that competition has accomplished its full work in the adjustment of prices to demand. The hard-wood supply has been increased with the increased consumption. New sources have been opened and much interest is exhibited by purchasers of valuable timber tracts for future reliance, in sections of country recently penetrated by railroad extensions. Yellow and white pine and spruce have reached a very low and barely remunerative level. Walnut, oak and cherry of good qualities are firm in price though margins are narrow.

The iron trade has advanced one step toward remunerative prices. Nails are $2.25 to $2.30 at Pennsylvania mills, and are scarce, owing to the dependence of Western consumers on Eastern sources of supply, because of the strike which has been in existence since June first, restricting production about 60 per cent. Sheet-iron has advanced and mills are well supplied with orders. Merchant iron is selling at 1½ to 1¾ mill price. Refined cast steel is 8½ to 9 cents. The rapid progress made in the building of new steel works points to a reduction in prices next year. The receipts of tin-plates in the four ports — Boston, New York, Philadelphia and Baltimore — since January first have been 2,714,360 boxes; Russia sheet-iron, 16,191 packages; steel and iron rods, 60,000 tons in round numbers. The bridge builders and structural iron manufacturers have had their capacity fully employed for three months, and prospective requirements point to an active winter under low prices. The leading manufacturers of ranges and stoves have put fully as much stock on the market this year as last. Those who have not, represent less popular makes and styles. The slate interests complain of sluggish demand and destructive competition. The manufacturers of gas-engines find that profits have been curtailed under the competition of the many aspirants for the trade, which from good sources it is known are steadily growing in number. The supply of various roofing materials has been considerably increased this year, and current prices show those products have been no exception to the rule which has affected all products. The manufacturers of wood-working machinery have produced as much machinery in value as during any year. Certain makers report an increase varying from 10 to 25 per cent, but at prices varying from 5 to 15 per cent less than last year. Brick, lime, cement, etc., have fluctuated somewhat during the season, due to ordinary market influences. The development of architecture has stimulated manufacturers of building material to furnish better material in many branches of that expanding industry. Among these may be mentioned that of fireproof material, the demand for which has assumed very large proportions. The coming winter will probably be one of fair activity. Manufacturers will probably depart a little from their policy of extreme caution and will produce supplies more liberally, in view of an expected improving demand,

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

328,451. SAFETY-VALVE. — Joseph Barbe, Saint-Amand, Nord, France.
328,473. PENCIL-SHARPENER.—Eugene Fitch, Des Moines, Ia.
328,479. WEATHER-STRIP. — Solomon Funk, Spirit Lake, Ia.
328,483. REFRIGERATOR - BUILDING. — Joseph F. Hanrahan, Ottawa, Ontario, Can.
328,509. BUSH-HAMMER.—August Nelson, Kent, O.
328,549. FAN FOR VENTILATING MINES, ETC. — William Viggers, Des Moines, Ia.
328,550. COMBINED ANVIL, VISE AND DRILL. — Reuben Vosburgh, Oregon, Ill.
328,563. SASH - BALANCE. — Daniel E. Beverstein, Middlebury, Ind.
328,587. FEED-WATER HEATER.—Sam'l R. Hughes, Benton Harbor, Mich.
328,589. PAINT - SOLVENT. — Joseph Kotrba, St. Louis, Mo.
328,601. PIPE-WRENCH. — George F. Newell, Boston, Mass.
328,614. HYDRAULIC ELEVATOR. — George H. Reynolds, New York, N. Y.
328,636. FIRE-ESCAPE STEP-ROD ATTACHMENT. — William H. Barr, Conway, Mo.
328,637. FIRE-ESCAPE. — William H. Barr, Grove Spring, Mo.
328,643. MIXED PAINT.—Louis Brown, Rye, N. Y.
328,644. POWDER FOR ROOFING AND OTHER PURPOSES.—Louis Brown, Rye, N. Y.
328,645. CALCIMINE COMPOUND.—Sam'l U. Brunck and George A. Marsh, Sandusky, O.
328,648. BRACE-CHUCK. — John Chantrell, Bridgeport, Conn.
328,649. BIT-BRACE. — John Chantrell, Bridgeport, Conn.
328,661. WEATHER-BOARDING GAUGE. — Camillus Dunbar, Glenwood, and James A. Rector, Lancaster, Mo.
328,665. LEVELING-INSTRUMENT.—Abraham G. W. Foster, Newnan, Ga.
328,666. PAINT-REMOVER. — Frank P. Foster, Milwaukee, Wis.
328,668. PARALLEL AND RADIAL RULER AND LINEAR SPACER.—Chas. S. Gooding, Boston, Mass.
328,691. ADJUSTABLE WINDOW-SCREEN. — Forest M. Lampson and George W. Hogben, Ripon, Wis.
328,722. TRANSOM-LIFTER. — John H. Shaw, New Haven, Conn.
328,725. KEY-FASTENER. — Ambrose W. Sigerson, Burlington, Io.
328,763. LATCH.—Knud Clementsen, Chicago, Ill.
328,778-779. ERASIVE RUBBER. — Francis H. Holton, Brooklyn, N. Y.
328,793. LUMBER-WAGON.—William Leonhardt and John H. Leonhardt, Waverly, Md.
328,794. PLANING AND RESAWING MACHINE. — George Lhote, New Orleane, La.
328,809. HOT-AIR STOVE. — Richard A. Rew, Pomeroy, Wash.
328,814. DOOR-SILL. — Allison M. Roscoe, Du Bois, Pa.
328,818. SYSTEM OF VENTILATION. — Thomas J. Simpson, Worthington, Minn.
328,820. SAFETY-GATE FOR ELEVATORS. — Charles Sorber, St. Louis, Mo.
328,857. MIXED PAINT.—Charles Miller, Ingersoll, Ontario, Can.
328,858. DRIVEN-WELL POINT. — William C. Nye, Bradford, Pa.
328,873. TANK VALVE AND LEVER.—Jas. E. Boyle, Brooklyn, N. Y.
328,875. LATCH-LOCK. — Sam'l W. Budd, Philadelphia, Pa.
328,900. DOOR. — Jonah W. Moyer, Philadelphia, Pa.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty-five permits have been granted, the more important of which are the following: —

A. Mahone, 2 three-st'y brick buildings, w s Mount St., n of Patterson Ave.

Joshua Regester & Sons, four-st'y brick building, e s Halliday St., cor. Saratoga St.

M. I. Bonney, three-st'y brick building, e s Broadway, n of Monument St.

M. Burk, 6 two-st'y brick buildings, e e Harman Alley, s of Randall St.

D. Wingrove, three-st'y brick building, w s Williams St., n w cor. Montgomery St.

John Snyder, 3 three-st'y brick buildings, n s Fairmount Ave., commencing n w cor. Patterson Park Ave.

S. S. Clayton, three-st'y brick building, s s Courthouse Lane, between St. Paul and Calvert Sts.

Chew Snebley, four-st'y brick building, e s Courtland St., between Lexington and Saratoga Sts.

Louis Aldt, 2 three-st'y brick buildings, n s St. Mary's St., between Druid Hill Ave. and Penn Alley.

Frederick Stamp, 6 three-st'y brick buildings, commencing s w cor. McCulloh and Laurens Sts.; and 3 three-st'y brick buildings, s s Laurens St., e of McCulloh St.

Boston.

BUILDING PERMITS.—*Auburn St. No.* 47, dwell., 20' x 28'; owner, Horatio M. Arens; builder, John B. Lord.

Washington St., near Centre St., mercantile, 15' x 18'; owner, Chas. S. Gage; builder, Charles Stinson.

Whitney St., No. 29, mechanical, 15' x 16'; owner, William Gateiy.

Carolina Ave., near South St., dwell., 21' x 32'; owner, J. M. Fallon; builder, W. S. Mitchell.

Maple St., near Centre St., dwell., 22' x 32'; owner, Mrs. E. Wentworth; builder, W. S. Mitchell.

Bodwell St., near Columbia St., dwell., 23' 6" x 30'; owner, Weston Lewis, builder, John Horsford.

Sheridan Ave., near Chestnut Ave., dwell., 20' x 40'; owner and builder, John Scales.

Sweet St., near N. Y. & N. E. R. R., storage, 35' x 75'; owner, Bradley Fertilizer Co.; C. Tilden, Jr.

Rand St., No. 111, dwell., 22' x 43'; owner, Mrs. Ann Fallon; builder, Pinkham Russell.

Washburn St., near Dorchester Ave., dwell., 20' x 36'; owner, N. F. Snow; builder, C. E. Snow.

Elm St., near Breed St., dwell., 20' x 27'; owner, N. F. Snow; builder, Charles Walley.

Auckland St., near Savin Hill Ave., dwell., 22' x 34'; owner, Mrs. Annie Bass; builder, John Bass.

Dorchester Ave., No. 1452, storage, 18' 9" x 39' 9"; owner, Mary A. Godfrey; builder, Wm. Northrop.

Brooklyn.

BUILDING PERMITS. — *Sixth Ave.*, w s, 50' n Twenty-fifth St., 3 three-st'y frame tenements, tin roofs; cost, $3,500; owner and builder, Joseph Hopkins, 54 Schaeffer St.

Macon St., s s, 160' w Nostrand Ave., 6 three-st'y brick dwells., gravel roofs; cost, each, $3,000; owner, Wm. O. Thompson, 135 Lefferts Pl.; architect, O. D. Thompson.

Bushwick Ave., e s, 80' n Vanderveer St., two-st'y (brick-filled) dwell., tin roof; cost, $3,200; owner, F. Steinbacher, on premises; architect, H. Vollweiler; builder, J. Rueger.

India St., Nos. 77, 77½ *and* 79, n s, 200' e Franklin St., 3 three-st'y frame (brick-filled) dwells., gravel roofs; cost, $8,300; owner, James Brown, 81 India St.; architect, J. Dennin; builders, Port & Walker.

Reid Ave., e s, between Decatur and McDonough Sts., 8 four-st'y brick tenements, tin roofs; cost, each, $9,000; owner, architect and builder, H. Grassman, 384 Vernon Ave.

McDougal St., s s, 381' 3" e Hopkinson Ave., three-st'y brick tenement, tin roof; cost, $3,000; owner and architect, Gottlieb Baur, 86 McDougal St.; mason, C. Baur, contractor, not selected.

North Eighth St., s s, 235' w First St., eight-st'y and cellar brick sugar-refinery, gravel roof; cost, $30,000; owners, Dick & Meyers, South Ninth St., cor. Eighth St.

Willoughby Ave., n s, 100' e Kent Ave., 2 two-st'y brick dwells., tin roofs; cost, $4,000; owner and builder, Geo. Brawley, 250 Steuben St.; architect, G. E. Hawkins.

Melrose St., No. 22, n w s, 250' from Evergreen Ave., towards Central Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,400; owner, Adam Loeffler, on premises; architect, E. Schrempf; builder, J. Schneider.

Sixth St., w s, 50' n Division Ave., 2 four-st'y brick tenements, tin roofs; cost, each, $12,000; owner and architect, E. F. Gaylor, 66 Broadway; builder, Thos. Gibbons.

Madison St., n s, 300' e Ralph Ave., 2 two-st'y brick flats, tin roofs; cost, $12,000; owner, Austin Demill, Ralph Ave.; architect, F. Holmberg; builder, F. Stemler.

President St., No. 106, s s, 175' e Columbia St., four-st'y brick tenement, tin roof; cost, $8,000; owner, Daniel Bayha, President St., cor. Columbia St.; architect, C. Werner; builders, O. Nolan and J. Lee.

Norman Ave., n s, 73' w Lorimer St., 3 three-st'y frame (brick-filled) tenements, gravel roofs; cost, each, $2,000; owner, architect and contractor, S. W. Randall, 572 Lorimer St.; builders, I. & J. Van Riper.

Gothic Alley, e s, 70' e Adams St., four-st'y brick tenement, tin roof; cost, $7,500; owner, E. D. Phelps, 336 Fulton St.; architect, M. J. Morrill; builders, J. Carlin and Morris & Selover.

Boerum St., n s, about 258' e Old Bushwick Ave., two st'y frame (brick-filled) tenement, tin roof; cost, about $3,000; owner, Jacob Klein, 529 Bushwick Ave.; architect, F. J. Berlenbach, Jr.; builder, not selected.

North Portland Ave., e s, 71' n Park Ave., 3 four-st'y brick tenements, gravel roofs; cost, each, $7,000; owner, John G. Richardson, De Kalb Ave.; architect, M. J. Morrill; builders, P. J. Carlin and Long & Barnes.

Lafayette Ave., No. 340, s s, 225' e Grand Ave., three-st'y dwell., tin roof; cost, $10,000; owner, John Holsten, 221 Hooper St.; architect, Th. Engelhardt; builder, H. L. Antonius.

Dykeman St., n e, 100' e Conover St., 2 four-st'y brick tenements, tin roofs; cost, each, $14,500; owners, Messrs. Burtis & Betts, on premises; architect, Mr. Galvary; builders, M. Gibbons & Son.

Melrose St., n s, 250' w Knickerbocker Ave., three-st'y frame store and tenement, tin roof; cost, $4,000; owner, Joseph Abt, Melrose St.; architect, G. Hillenbrand; builder, C. Gessman.

ALTERATIONS. — *Waverly Ave.*, w s, 376' n Myrtle Ave., building, flat tin roof, interior alterations; cost, $12,000; owner and builder, J. Gordon, 374 Clermont Ave.; architect, R. Dixon.

Chicago.

BUILDING PERMITS. — Vulcan Iron Works, four-st'y addition, 88-94 Clinton St.; cost, $10,000,

N. S. Jones, three-st'y dwell., 88 Bellevue Pl.; cost, $75,000.

J. M. Oliver, two-st'y flat, 678-680 Austin Ave.; cost, $4,000.

L. D. Huesner, two-st'y dwell., 3662 Wabash Ave.; cost, $3,600.

W. H. Hoyt, 7 four-st'y dwells., cor. Pine and Ohio Sts.; cost, $60,000.

P. E. Hamm, two-st'y dwell., 1179 Jackson St.; cost, $3,500.

W. E. Mason, two-st'y dwell., 132 Walnut St.; cost, $3,500.

H. Anderson, two-st'y flats, 671 Thirty-seventh St.; cost, $2,500.

Agar & Marshall, 6 three-st'y dwells., 168-178 Seminary Ave.; cost, $20,000; architect, S. Piggott.

Estate W. J. Johnson, 2 four-st'y stores and dwells., 205-207 Chicago Ave.; cost, $15,000.

H. Lemke, three-st'y dwell., 1024 West Harrison St.; cost, $4,500.

J. Lardner, two-st'y dwell., 299 Loomis St.; cost, $3,000.

E. Smith, two-st'y dwell., 299 Loomis St.; cost, $8,500; architect, W. Strippelman.

J. Sullivan, three-st'y flats, 310 Desplaines St.; cost, $3,500.

C. LaBerge, three-st'y flat, 107 Sibley St.; cost, $3,000.

The Chicago Art Institute, four-st'y art institute, cor. Van Buren St. and Michigan Ave.; cost, $100,000; architects, Burnham & Root; builders, J. Barker & Son.

Miss M. Henderson, two-st'y flats, 1142 Washington Boulevard; cost, $5,000.

T. Kirkwood, two-st'y dwell., 850 Washington Boulevard; cost, $4,500.
J. F. Ewing, 3 cottages, West Thirteenth St.; cost, $2,500.
D. F. Bacon, 2 two-st'y dwells., 147-149 Thirty-third St.; cost, $8,000.
G. M. Hull, two-st'y dwell., 237 Leavitt St.; cost, $4,000.
A. McCullough, bakery, 1809-1811 State St.; cost, $2,500.
Mrs. A. J. Davis, two-st'y dwell., 276 Irving St.; cost, $4,000.
M. Schmidt, three-st'y store and dwell., 2250 State St.; cost, $10,000.
R. S. Pike, three-st'y store and flats, 2330-2332 State St.; cost, $16,000.
E. Crowhurst, two-st'y store and dwell., 1037 Elston Ave.; cost, $2,500.
O. Burmeister, three-st'y store and dwell., 133-135 Clybourne Ave.; cost, $8,000.
G. Bloom, two-st'y dwell., 459 West Congress St.; cost, $4,500.
O. Carlson, three-st'y flats, 547 Erie St.; cost, $4,-500.
Mrs. M. E. Sands, 5 two-st'y dwells., 845-855 West Jackson St.; cost, $10,000.
J. Pirce, two-st'y store and dwell., 639 Nineteenth St.; cost, $4,000.
W. H. Thomas & Son, 4 cottages, Hoyne Ave.; cost, $6,000.
F. J. F. Weinert, two-st'y dwell., 818 West Congress St.; cost, $4,400.
H. W. Coolidge, two-st'y dwell., 2917 Groveland Park Ave.; cost, $4,000.
E. H. Preston, three-st'y dwell., 19 Delaware Pl.; cost, $10,000; architects, Treat & Foltz.
Armour Memorial Building, mission building, cor. Thirty-third and Butterfield Sts.; cost, $60,000; architects, Burnham & Root; builders, Barney & Rodatz.
C. Stein, two-st'y dwell., 519 State St., cost, $2,-500; architect, T. Karls.
W. Bansenbach, three-st'y store and dwell., 566 West Twelfth St.; cost, $8,000; architects, Furst & Rudolph.
G. N. Hull, 6 two-st'y dwells., Jackson St.; cost, $40,000.
W. S. Hall, additional st'y 407-411 Harrison St.; cost, $7,000.
E. R. Ayer, two-st'y store and dwell., 481 State St.; cost, $30,000.
W. Dargan, two-st'y dwell., 204 Racine Ave.; cost, $2,500; architect, W. Linderoth.
Sosman & Landis, two-st'y scenic studio building, 236-238 South Clinton St.; cost, $12,000.
G. P. Braun, two-st'y dwell., 174 Eugenie St.; cost, $8,000.
R. Bermann, two-st'y store and dwell., cor. Indiana and May Sts.; cost, $3,000.
Carter H. Harrison, 14 two-st'y dwells., 623-643 Flournoy St.; cost, $28,000.

Cincinnati.

BUILDING PERMITS.—Dr. E. Williams, two-st'y frame dwell., cor. Boone and Madison Sts., Coreyville; cost, $3,500.
J. P. Cunningham, two-st'y brick dwell., 119 Colrain Ave.; cost, $2,500.
Jung Brew. Co., three-st'y brick dwell., cor. Coleman and Freeman Sts.; cost, $3,500.
Williams & Co., four-st'y brick dwell., Longworth St., near Elm St.; cost, $3,500.
Geo. W. McAlpin, addition to five-st'y stone-building, 119 West Third St.; cost, $4,200.
Last permit, 5513.
Cost of 5 repairs, $2,925.
Total cost to date, $225,836.

Kansas City, Mo.

BUILDING PERMITS. — Charles E. Emery, house on East Tenth St.; cost, $8,000.
John J. Mastin, business block, 406 and 408 Main St.; cost, $3,500.
J. A. Swarthout, frame block, Forest Ave.; cost, $3,000.
Freeman Gates, frame house, East Eighteenth St.; cost, $5,000.
Stewart & Holmes, two-st'y brick stable, West Fourth St.; cost, $18,000.
Val Blatz, brick business building, cor. Levee and Walnut Sts.; cost, $7,500.

Minneapolis, Minn.

BUILDING PERMITS. — R. H. Evans, two-st'y wood dwell., n e s Portland Ave., bet. East Twenty-sixth and East Twenty-seventh Sts., s; cost, $3,500.
Mrs. Holway, two-st'y stone dwell., s e cor. Fourth St. and Twenty-ninth Ave., n; cost, $1,000.
Mrs. Holway, two-st'y brick dwell., n e s Third St. and Twenty-eighth and Twenty-ninth Aves., n; cost, $3,000.
Mrs. Holway, two-st'y stone dwell., Third St., bet. Twenty-seventh and Twenty-eighth Aves., n; cost, $3,000.
Mrs. Holway, two-st'y stone dwell., e s Fourth St., bet. Twenty-eighth and Twenty-ninth Aves., n; $3,500.
Mrs. Holway, two-st'y stone dwell., w s Third St., bet. Twenty-seventh and Twenty-eighth Aves., n; cost, $3,000.
Mrs. A. D. Morgan, two-st'y brick veneer dwell., s s Forest Ave., bet. Lyndale and Lindley Aves.; cost, $3,500.
S. G. Cook & Co., five-st'y brick warehouse, n e s First St., bet. Seventh and Eighth Aves., n; cost, $30,000.
Mrs. J. W. Berdwell, two-st'y double wood dwells., e s Spruce Pl., bet. Fourteenth and Fifteenth Sts.; cost, $6,000.
Mrs. J. W. Berdwell, two-st'y wood dwell., n s Fifteenth St., bet. Nicollet Ave. and Spruce Pl.; cost, $6,000.
Geo. A. Salmon, two-st'y wood dwell., e s Higland Ave., bet. Oaklake addition; cost, $3,000.
Geo. A. Salmon, two-st'y wood dwell., e s Higland Ave., bet. Oaklake addition; cost, $3,000.
Geo. A. Salmon, two st'y wood dwell., e s Higland Ave., bet. Oaklake addition; cost, $3,000.
Jno. Brandt, two-st'y double wood dwell. and barn, w s Sixth Ave., bet. East Seventeenth and East Eighteenth Sts., s; cost, $6,000.
Jno. Greening, two-st'y wood dwell., n s Third Ave., bet. East Twenty-seventh and East Twenty-eighth Sts.; cost, $3,000.
Benj. F. Abbott, s e cor. Fifteenth Ave. and North Dupont Ave.; cost, $3,000.
James Carlisle, two-st'y wood dwell., e s Six-and-a-half Ave., bet. East Twentieth and East Twenty-second Sts.; cost, $3,000.
W. H. Gruff, two-st'y wood dwell., w s Second Ave., bet. East Twentieth and East Twenty-second Sts.; cost, $7,000.
Joseph Boswell, two-st'y wood dwell., e s First Ave., bet. East Twenty-eighth and East Twenty-ninth Sts.; cost, $4,500.
J. Koehl, two-st'y wood dwell. and barn, s e s Adams St. and Thirteenth Ave.; cost, $3,300.
F. E. Saunders, two-st'y wood dwell., w s First Ave., bet. East Thirty-first and East Thirty-second Sts.; cost, $3,000.
F. E. Saunders, two-st'y wood dwell., e s Nicollet Ave., bet. East Thirty-first and East Thirty-second Sts.; cost, $3,000.
W. H. Eustis, six-st'y brick office building, cor. Third St. and Fourth Ave., s; cost, $70,000.
J. L. Ballard, two-st'y wood dwell., w s First Ave., bet. East Thirty-first and East Thirty-second Sts., s; cost, $3,000.

New Haven.

BUILDING PERMITS. — Following are the permits issued since my last report:—
Foote St., 2 two-st'y brick dwells., 23' x 41'; cost, $4,000, owner, Jeremiah Donovan.
East St., cor. State St., two-st'y brick store and tenement, 22' x 39'; cost, $3,000; owner, Rose Maher.
Frank St., two-st'y frame store and dwell., 22' x 40'; cost, $3,000; owner, Mrs. Ann McDonald.
Atwater St., cor. Pine St., 2 two-st'y frame dwells., 23' x 37'; cost, $3,000; owner, J. W. Howland.
George St., near Temple St , brick building, 25' x 54'; owner, N. H. Electric Lighting Co.
Whalley Ave., near Howe St., three-st'y brick building, mansard slate roof, 30' x 50'; cost, $7,000; owner, Mrs. Ida L. Todd.
Admiral St., two-st'y frame dwell., 28' x 40'; two-st'y frame barn, 18' x 26'; cost, $3,500; owner, Chas. McFeetus.

New York.

Very little of interest has come up during the month, but after election it is anticipated that several matters may be decided that are now "hanging fire."
BANK.—A large bank building is to be erected at Nos. 34 and 36 Wall Street, in which the Gallatin National Bank will be interested.
STORE.—A store on Fifth Ave., between Forty-first and Forty-second Sts., for Mr. Robert Graves is probably to be erected.
FLATS.—Several flats of the ordinary style are likely to be started before the close of the season.
BUILDING PERMITS. — *Third Ave., No.* 380, five-st'y brick tenement, flat tin roof; cost, $27,000; owner, Geo. R. Read, 19 Nassau St.; architect, O. Wirz, 405 East Sixty-fifth St.
West Seventeenth St., No. 420, five-st'y brick tenement, flat tin roof; cost, $12,000; owner, Teresa V. and Annie E. Bannon, 205 West Thirty-sixth St.; architect, Joseph Wolf, 314 West Thirty-sixth St.
Washington Ave., w s, 220' s One Hundred and Sixty-eighth St., one, two and basement st'y, brick and frame dwell., flat tin roof; cost, $5,000; owner, Jas. McMalien, 1331 Washington Ave.; architect, H. S. Baker, 492 East One Hundred and Thirty-eighth St.
West Forty-seventh St., No. 428, five-st'y brick tenement, flat tin roof; cost, $25,000; owner, Wm. Rankin, 253 West Fifty-first St.; architect, Geo. Keister, 347 West Forty-third St.
Seventh St., s s, 57' e Ave. D, three-st'y brick dwell., flat tin roof; cost, $3,800; owner, Mrs. Muller, s e cor. Seventh St. and Ave. D; architect, William Shears, 118 East Thirty-ninth St.
Eighty-third St., n s, 250' w Ave. A, 2 five-st'y brick tenements, flat tin roofs; cost, $36,000; owner, Ph. Brauder, 122 East Eighty-fifth St.; architect, John Brandt, 1491 Third Ave.
Seventy-first St., n s, 325' w First Ave., 2 five-st'y brick tenements, flat tin roofs; cost, $30,000; owner, Jennie S. Macdonald, 1532 Park Ave.; architect, John Brandt, 1491 Third Ave.
Ninth Ave., s w cor. Sixty-eighth St., 5 five-st'y brick tenements, flat tin roofs; cost, $100,000; owners, John Berkel and Wm. McKeau, 16 Beekman St.; architects, Babcock & McAvoy, 64 College Pl.
Ninetieth St., s s, 100' e Ninth Ave., 4 four-st'y brick dwells., brown-stone fronts, flat tin roofs; cost, $61,000; owners, Herman Hoefer, Fifty-fifth St. and Broadway, and Wm. E. D. Vincent, 326 West Forty-seventh St.; architects, Thom & Wilson, 1267 Broadway.
Madison Ave., n e cor. Seventy-eighth St., 5 four-st'y and basement brick dwells., brick and brown-stone fronts, mansard, tin, slate and fire-proofing block roof; cost, $135,000; owner, Anthony Mowbray, 101 East Eighty-fifth St.; architect, Wm. E. Mowbray, 13 East Sixty-third St.
One Hundred and Forty-fifth St., s s, 100' e Willis Ave., 2 three-st'y brick dwells., flat tin roof; cost, $10,000; owner, Alexander Hicenbottern, 666 East One Hundred and Forty-fifth Street; architects, Schmidt & Garvin, 20 Church St.
Downing St., s s, 80' e Bedford St., four-st'y and basement dwell., flat tin roof; cost, $5,000; owner, Francis Neppert, 390 Canal St.; architect, Andrew Spence, 2294 Third Ave.
One Hundred and Sixty-fourth St., n e cor. Cauldwell Ave., 3 two-st'y and attic brick and frame dwells., peak shingle roofs; cost, $10,500; owner, Geo. Faile, 916 Prospect Ave.; architect, Chas. P. H. Gilbert, 18 Broadway.
Ninety-fourth St., n s, 100' e Tenth Ave., 9 three-st'y and basement dwells., brown-stone fronts; cost, $81,000; owners, Squire & Whipple, 111 Broadway; architect, Edward Chester Smith, 221 Washington Ave., Brooklyn.
Second Ave., e s, 75' s Seventy-first St., five-st'y brick tenement, brown-stone front, flat tin roof; cost, $12,000; owner, Frederick R. Frech, Staten Island; architect, Fr. S. Barus, 469 North Third Ave.
Seventy-first St., s w cor. Ninth Ave., five-st'y brick tenement, brown-stone front, flat tin roof; cost, $25,000; owner, John T. Farley, 402 West Seventy-third St.; architects, Thom & Wilson, 1267 Broadway.
Eighty-eighth St., s s, 89' e Lexington Ave., 4 five-st'y brick tenements, flat tin roofs; cost, $80,000; owner, Philip Braender, 122 East Eighty-fifth St.; architect, John Brandt, 1491 Third Ave.
Third Ave., e s, from One Hundred and Fourteenth St. to One Hundred and Fifteenth St., 8 five-st'y brick tenements, flat tin roof; cost, six $18,000 each; two $25,000 each; owner, Eva Muller, 416 East Seventy-sixth St.; architect, John Brandt, 1491 Third Ave.
Third Ave., e s, 25' 5" n Sixty-seventh St., brick, freestone and terra-cotta trimmings, flat tin roof; cost, $54,000; owner, Marcus Kohmer, 147 East Forty-seventh St.; architect, Bart. Walther, 2255 Third Ave.
Third Ave., n e cor. Sixty-seventh St., five-st'y brick workshop, flat tin roof; cost, $20,000; owner and architect, same as last.
West One Hundred and Fourth St., Nos. 509-515, 4 five-st'y brick tenements, flat tin roofs; cost, $80,-000; owners, Gillie, Walker & Lawson, 517-521 West One Hundred and Fourth St.; architect, Jas. W. Cole, 401 West Forty-sixth St.
Mott Ave., w s, 382' 3" s One Hundred and Forty-fourth St., 2 three-st'y and basement brick dwells., flat tin roofs; cost, $12,750; owner, B. J. M. Carley, 348 Mott Ave.; architect, W. M. Coots, 26 Court St., Brooklyn.
ALTERATIONS. — *East Fourteenth St., No.* 3, 2 brick buildings, formerly a hotel, to be altered as ware-rooms, etc.; cost, $25,000; lessee, Henry C. Stephens, New London, Conn.; architect, Jas. H. Giles, 59 Williams St.
Madison Ave., n w cor. Fifty-sixth St., four-st'y brick dwell., flat tin roof, alterations; cost, $3,000; owner, Francis S. Kinney, New Brighton, Staten Island; architect, John H. Duncan, 237 Broadway.
St. Ann's Ave., e s, 100' s One Hundred and Sixty-first St., five-st'y brick storage and refrigerator building, peak roof, alterations, etc.; cost, $5,000; owner, Adolph Hupfel, St. Ann's Ave., cor. One Hundred and Sixty-first St.; architect, A. Pfund & Son, 232 West Thirty-sixth St.
Canal St., No. 162, cor. Elizabeth St., two-st'y and attic store and dwell., peak roof, altered to flat tin roof; cost, $4,000; lessee, Jacob Davidson, 170 Canal St.; architect, Chas. Rentz, 80 Greenwich St.
Canal St., No. 160, two-st'y and attic brick store and dwell., roof altered, etc.; cost, $3,500; owner, Jacob Davidson, 170 Canal St.; architect, Charles Rentz, 80 Greenwich St.

Philadelphia.

BUILDING PERMITS. — *Amboy St.*, s e cor. Columbia Ave., three-st'y store, 18' x 54'; J. Stafford, owner.
Haverford St., w Thirty-first St., 10 three-st'y dwells., 16' x 46'; H. Watkin, owner.
North Broad St., No. 2900, two-st'y stable, 16' x 100'; H. Bayard & Co., owners.
Entrance Lodge to Greenmount Cemetery, two-st'y brick with tower; Hazelhurst & Huckel, architects.
Mountain St., w Nineteenth St., 10 two-st'y dwells.; Thomas Grinnan, owner.
John St., w Second St., 3 two-st'y dwells.; Wm. Bartholomew, owner.
Emerald St., s Tioga St., 5 two-st'y dwells.; Ed. J. Develin, owner.
Wishart St., e Emerald St., 4 two-st'y dwells.; A. I. Richards, contractor.
North Second St., No. 2304, three-st'y dwell.; H. G. Schultz, owner.
Penn St., near Chew St., three-st'y stone dwell.; Geo. Harrison, contractor.
Fifth St., above Pike St., 5 two-st'y dwells.; Gladding & Bros., contractors.
Eighth St., s Tioga St., two-st'y dwell.; James H. Darff, contractor.
Fourth St., s Bainbridge St., three-st'y dwell.; Geo. Nebecker, contractor.
Knox St., s Seymour St., three-st'y dwell.; J. Sims Wilson, contractor.
Rednor St., w Twenty-second St., three-st'y stable; A. A. Stewart, owner.
Fitzwater St., No. 2116, three-st'y dwell., Wm. Forbes, contractor.
Fifth St., n Dauphin St., three-st'y dwell.; Jas. Quigley, contractor.
Forty-second St., n Brown St., 10 two-st'y dwells.; Geo. E. Goldbeck, owner.
Ashmead St., near Main St., 4 two-st'y dwells.; David S. McNabb, contractor.
Cedar St., near Terrace St., 4 two-st'y dwells.; Jas. Boone, owner.
Forty-ninth St., n Chester St., 4 three-st'y dwells.; Jas. D. Arthur, contractor.
Broad St., cor. Ellsworth St., three-st'y dwell.; Jno. Gibson, contractor.
Sloan St., n Filbert St., 4 two-st'y dwells.; Thos. C. Sloan, contractor.
Twenty-third St., n Norris St., two-st'y dwell.; E. H. Flood, owner.

St. Louis.

BUILDING PERMITS.—Fifty-seven permits have been issued since our last report, eight of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—
Robert Moore, two-st'y brick dwell.; cost, $12,-000; Peabody & Stearns, architects; J. Strimple & Son, contractors.
J. G. Haller, 2 adjacent, two-st'y brick stores and dwells.; cost, $2,500; Fred Knittel, contractor.
Ed. R. Boyers, two-st'y brick dwell.; cost, $5,000; P. F. Meagher & Son, contractors.
A. Hangge, two-st'y brick store bakery and dwell.; cost, $6,000; Aug. Beinke, architect, Shildeman & Gross, contractor.



Heliotype Printing Co., Boston.

TEMPLE EMANUEL, FIFTH AVENUE, NEW YORK, N. Y.

LEOPOLD EIDLITZ, Architect.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. No. 515.

NOVEMBER 7, 1885.

Entered at the Post-Office at Boston as second-class matter.

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A GREAT deal of discussion has taken place among those interested in insurance about the "valued-policy" law, which the State of New Hampshire, in imitation of two or three others farther west, has just enacted. It is well known that in ordinary cases insurance companies accept the owner's valuation of the property which he wishes to insure as a basis for calculating the premium, but set their own value upon it, which often differs widely from his, when they are called upon to indemnify him in case of loss; and it often happens in consequence that over-cautious people pay in premiums a much larger sum to the insurance companies than would purchase for them all the benefit, in the way of indemnity, which they would secure in case of loss. It is not surprising that this system of taking pay for one thing and delivering in return, if occasion offers, something quite different, appears unbusinesslike to those who suffer by it, and all valued policy laws provide, primarily, that if an insurance company accepts a certain valuation of a piece of property, and receives premiums calculated upon that valuation it shall, unless some fraud or misrepresentation on the part of the owner can be shown, pay, in case of total loss, the full sum previously accepted as the value of the property. This does not seem, in theory, a very unreasonable regulation, but its adoption imposes upon the insurance companies new duties and risks of a serious character. In the first place, if they are not to be allowed to question the accuracy of a valuation once accepted, they must keep an enormous force of experts, not only to inspect and value every risk on which they issue a policy, but to watch it during the term of the policy, and, if any portion of it is removed or deteriorated, to estimate the value of the loss or deterioration, and the cost of this expert service must of course be borne by the insured, as the companies cannot, as a rule, even under the common system, earn more than enough in the way of dividends to keep capital in the business. Since the addition of expert expenses to the ordinary premiums would raise the cost of insurance in valued-policy States to an enormous rate, the inhabitants of such States in practice hardly attempt to insure their property in companies subject to the laws which they have themselves made, but, either openly or surreptitiously, make contracts of insurance with companies doing business in other States, and under laws of a different sort. Even this method of evading the statute is, however, attended with inconveniences to those who wish to avoid paying extravagant prices for their insurance. It is found by statistics that valued-policy laws encourage people to set fire to their houses or stores, after insuring them at a valuation which, once secured, cannot afterwards be contested, and the encouragement of incendiarism in a community increases the risk of fire, and with it the cost of insurance, in that community, independent of other circumstances; while, even after paying the excess of premium due to this cause, the inhabitant of New Hampshire, for instance, who insures his house in another State to escape the cost of expert examination finds himself, in case of difficulty in adjusting a loss, obliged to carry on his negotiations at a distance from home, and under all the disadvantages which surround the man who carries on a dispute with a foreign opponent in his opponent's own territory. Unfortunately, the insurance business is not always carried on with perfect integrity on the part of the companies and their agents, and many a poor man has been shamefully swindled by being compelled either to submit to a discount from an undisputed loss, or to waste his time and substance in securing redress in the courts; and the valued-policy laws, which virtually drive those who make them to seek insurance in States beyond their own jurisdiction, arm unscrupulous insurers with a new and tremendous weapon, by enabling them to offer to their victims, who come to them for indemnity for losses, a choice between accepting half or two-thirds the sum due them, or incurring ruinous expense in trying to get the remaining third, with a strong probability of failure in the end.

A CURIOUS custom prevails in England in regard to the setting of terra-cotta, which, so far as we know, has not yet been imported to this country; and, as the use of terra-cotta is extending here with very great rapidity, it is much for the interest of architects and their clients to see that the trades-unions do not take the control of this invaluable building material out of their hands. Five or six years ago the English brick-layers took it into their heads that they were the proper persons to set terra-cotta of all kinds in its place in a building, and they resolved to prevent any one else from doing that work. In point of fact, a brick-layer is much less adapted by training for setting terra-cotta than a good cut-stone setter, who is accustomed to working with more accuracy, and understands much better how to trim and take care of delicate sculpture. These considerations, however, do not seem to have occurred to the brick-layers, and they seized the opportunity presented by the construction of a large building in which much terra-cotta was used to enforce, by the familiar method of striking, their demand to be entrusted with the setting of it in place. In this case, as we recollect, they were victorious, and they have followed up their advantages with watchful persistency. Not long ago, as we learn from a letter in the *Builder*, another contest took place, in a case where some stone-setters had been very innocently engaged to set the terra-cotta in a certain bank building. No sooner did they begin their task than the brick-layers employed on the building left their work. As it was impossible to set terra-cotta without walls to put it in, the master builder went to the brick-layers with an offer to allow them to set half the terra-cotta, keeping the rest, presumably the more highly decorated half, for the stone-layers. This offer was refused; and as there was no alternative, the stone-setters were discharged, and the terra-cotta put up with the aid of such tools and skill as brick-layers are accustomed to use.

LE GENIE CIVIL gives a curious account of the method employed at the mines of Grenoble for procuring the limestone from which the celebrated cement of the Porte de France is made. The Porte de France cement is made from a very fine-grained argillaceous limestone, containing about twenty-four per cent of clay, mixed very uniformly through it. Two kinds of cement are made, by means of differences in the degree of calcination, one quick and the other slow setting, and both are extensively used throughout France. The veins of cement stone are found at or near the top of the Mount Jalla, a lofty peak which rises to a height of fourteen hundred feet above the town of Grenoble, which lies at its foot. Two veins are worked, one at the very top of the mountain, and the other at some distance below, the latter being reached by a shaft from the top. The furnaces for burning the stone are in the town, fourteen hundred feet below the mine, and the mountain side between is extremely rough and broken. To construct a road overland, unless a very circuitous one, would have been impracticable, and an ingenious device was adopted for making a track through the air for transporting the ore to the place where it was wanted. With this intention two strong steel cables were stretched entirely clear of the ground, from the summit of the mountain to a station near its foot, just above the furnaces for burning the cement. The length of these cables is about two thousand feet, and they weigh six tons apiece. The upper ends are anchored to the rock, and the lower ones are coiled around powerful windlasses, which serve to keep them always stretched to the proper tension. The cables, which run parallel with each other, and about ten feet apart, form, so to speak, the tracks of an aërial railway, on which run suspended baskets, or rather boxes of strong plank, large

enough to hold a ton of ore apiece. The boxes are suspended from grooved wheels, which run on the cable, and are attached also to a light endless rope, which runs around horizontal pulleys at the top and bottom of the line, large enough to keep one side of the endless rope over each of the fixed cables. The boxes are so placed on the endless rope that when one is at the top of the mountain, the other is on the other side of the rope, at the lower station. The upper box is then filled with ore, and cast loose. Its weight carries it quickly to the foot of the line, at the same time that the empty box, fastened to the other side of the endless rope, is drawn up to the starting point, when the process is repeated. The trip is made in a minute and a half, and the loading and unloading of the boxes, which takes place at the same moment, occupies an equal time, so that, including all stops, a hundred and fifty tons of ore a day can be transported over the line. The lower cable station is, however, some distance above the furnaces in which the ore is calcined, and in order to reach these the ore is discharged from the boxes, on reaching the foot of the cable, into a shaft, through which it falls into wagons, which carry it through a subterranean gallery directly to the platform of the furnaces.

OUR readers will remember the description given some months ago in these pages of a new saw for cutting stone, consisting of a twisted cord of steel, made to run around pulleys like a band-saw. This apparatus has now been perfected and put into use. The cord employed is composed of three steel wires, rather loosely twisted together, but stretched tight over the pulleys, and is run at a high rate of speed. The swift succession of blows from the ridges of the cord, delivered along a narrow line, disintegrate the stone rapidly, and the loosened particles, entangled among the wires of the cord, are said materially to help the erosion. However this may be, the effect of the saw, which is allowed to press lightly on the block of stone beneath it, is much greater than that of the ordinary blades supplied with sand, the usual rate of cutting in blocks of oölite, or soft limestone, being about twenty-four inches an hour, and in Carrara marble a little more than nine inches an hour. The hard granite of Brittany is cut at the rate of nearly an inch and a quarter an hour, and even porphyry can be worked at the rate of eight-tenths of an inch an hour. In rougher cutting, such as is done at the quarries, the saw can be driven more rapidly, and with greater pressure on the stone, and its efficiency is increased about one-third. In certain marble quarries in Belgium, this process, which is known by the name of its inventor, M. Gay, is used on an extensive scale, the blocks of stone being not only divided for use, but extracted from the quarry, entirely by means of the cord saw. In using it for quarrying, a suitable portion of the surface of a stratum of marble is first cleared, in the usual manner, and a drill is brought upon the ground, resembling the diamond drill, except that the cylinder of sheet steel of which it is made has no diamonds set in the edge, but is fed with a hard metallic powder, apparently resembling the chilled iron sand used in this country for cutting and polishing granite. With this drill, which is driven by a pulley and rope, a little shaft is easily driven into marble at the rate of two feet an hour, cutting out a cylinder of stone twenty-seven inches in diameter, which is then detached and lifted out, and forms a saleable block without further treatment. Two of these drill-holes having been sunk, at a suitable distance apart, guides are set up in them, on which move frames carrying pulleys of a diameter somewhat less than that of the hole; and over these pulleys a cord saw is stretched. Motion is imparted to the pulleys by a simple system of transmission, and the saw cuts without interruption until the bottom of the drill pits is reached. In this way blocks of any size can be taken out, with a waste from saw and drill cuts amounting to only about one-half of one per cent, while the loss by the usual methods of quarrying is often thirty-five or forty per cent of the whole amount of stone extracted. The saving of time is even greater than the economy of material, the new appliances accomplishing, it is said, fifteen times as much work in a given period as was possible under the old methods.

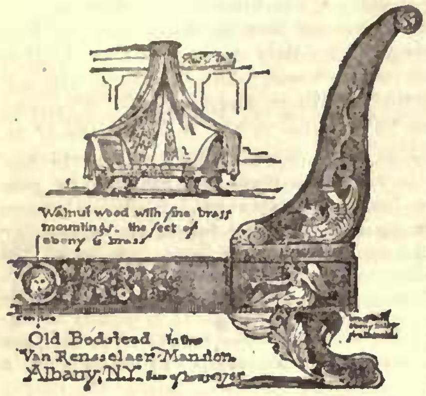
THE *Builder* gives some statistics of the municipal expenses of Paris, which, when compared with the items of the ways in which the money of our own city tax-payers is spent, have a considerable interest. The population of Paris is now about twenty-three hundred thousand, which is not very much more than that of the group of communities which form the real city of New York; but Paris has had for many years a source of income, in the shape of the octroi tax upon market supplies, which is lacking to other great cities. According to the *Builder*, the municipality of Paris has spent on public works, since 1852, three hundred and seventy-three million dollars. One hundred and sixty-seven million, or something less than one-half, has been spent on streets, which are in Paris built in the most thorough and costly manner. The Hôtel de Ville, with the various city schools, churches, hospitals, markets and smaller municipal buildings, have absorbed fifty-seven millions; forty millions have gone to the maintenance of the public parks and gardens; and water-pipes and sewers have taken the rest. The city derives good interest on the sums spent on water-service from the rates paid by householders, and a large income, amounting to nearly four-and-one-half millions a year is obtained from the lease of cab-stands and stalls in the markets.

A LITTLE case of forfeiture for delay was tried in England not long ago, according to the *Builder*. The defendant in the case was a carpenter, who entered into a contract to build three cottages, to be completed in three months, and he also agreed to forfeit ten dollars a week for every week that they should remain unfinished after the specified period. Instead of three months, it was more than six months before the buildings were finished, and the owner claimed a forfeiture of ten dollars a week for fifteen weeks delay beyond the contract time of completion. The counsel for the defendant submitted that the forfeiture, if any, should be reduced to the actual damage suffered by the plaintiff, which would in this case amount simply to the loss of rent from the cottages during the time that they remained incomplete after the specified period. The rent of each cottage was seventy-five cents a week, or two dollars and a quarter a week for the three, and at this rate the total damage for fifteen weeks would be thirty-three dollars and seventy-five cents. He mentioned, moreover, that the contract had been taken at about two-thirds of the actual value of the work, and that his client had been ruined by it, and was trying to save the expenses of bankruptcy by giving up half his weekly earnings to his creditors. The judge seems to have agreed with the defendant's counsel, that the forfeiture should be reduced from the sum stipulated in the contract to a fair compensation for the actual damage suffered; but he estimated this a little more liberally than the defendant's lawyer, and ordered judgment for the plaintiff for fifty dollars.

THE highest chimney yet built in the world has just been completed at the Mechernich Lead-works in Germany. The whole height of the structure is approximately four hundred and forty feet, eleven feet of which is under ground. The subterranean portion is of block-stone, thirty-seven feet square in plan, all the rest is of brick. The plinth, or lower part of the chimney above ground, is thirty-four feet square, so that the height of the shaft is nearly thirteen times the lower diameter. For about thirty-four feet the chimney continues square; then becomes octagonal in plan for a little distance, and finally changes to a circular form, retaining this shape to the top. The exterior diameter of the shaft at the top is about eleven and one-half feet. The flue is eleven and one-half feet in diameter at the bottom, and ten feet at the top. Until the completion of this chimney that of the St. Rollox Chemical Works near Glasgow, which is four hundred and thirty-four feet high, had the reputation of being the tallest in the world.

WERE it not that we had carelessly mislaid the circular which gives detailed information concerning the exhibition of architectural drawings which is to be held in New York during January and February, it would have been laid before our readers in an earlier issue. The drawings are to be shown in connection with the annual exhibition of the Salmagundi Club, and this fact has caused the committee in charge to decide against the admission of photographs, arguing that as the members of the Salmagundi Club exhibited in black and white, the architects could not do otherwise without destroying the homogeneity and harmony of the exhibition. This ruling surprises us, and we think it is unjust to the many architects who "don't draw," but who do design and build — and do both well. It seems to us to so take the exhibition down a grade or two, making it an affair of artistic draughtsmanship rather than of architecture, that we hope a few screens will be devoted to photographs.

THE AMERICAN INSTITUTE OF ARCHITECTS AT NASHVILLE.



THE Convention of the American Institute of Architects at Nashville, Tenn., held on October 21 and 22, called together about the usual number of members and visiting architects, the latter mainly from southern cities, and proved to be a very profitable and enjoyable occasion to all present. The Nashville Art Association, whose guests the members of the Convention were, gave us a most hearty welcome, made us feel very much at home, and surrendered to us, as it were, the keys of their pleasant and home-like city.

Our little party from the East started from New York on Monday morning, 19th, at 9, and arrived at Nashville on Tuesday night at 7.30. Headquarters were at the Maxwell House, where a number of members were found who had preceded us. This hotel is a roomy, convenient house, with a fine stone portico in front; its large vestibule, extending to the second-story ceiling, is surrounded with a quite imposing colonnade and galleries. The dining-hall is very large, with a *pronaos* at either end formed of a range of columns; the ceiling is pierced with star-shaped embrasures filled with glass and throwing a softening light upon the tables below. The hotel is said to have been erected at about the close of the war, after designs by the architect of the Custom-House and other public buildings in New York, Isaiah Rodgers.

Wednesday morning found us wending our way to the Capitol, a building of fine general contour, of Classic design, and set upon an abruptly high, rocky hill, as an acropolis in the centre of the city. This building was of considerable interest to us, it being designed by James Strickland, the preceptor of President Walter, who in turn was the instructor of Mr. N. LeBrun, whom we had with us. At the death of Mr. Strickland, the Legislature ordered that a space be allotted in the Capitol to receive his remains; and a tablet inserted in the wall at the east end of the northern portico records this fact. A glance at this incited in us all the earnest interest natural in contemplating so rare an inscription. Like upon Wren's, a line might have been added: —

> "Would you see his monument, look around you."

The building is a rectangle, with its greatest length extending north and south; a finely-proportioned portico graces each end, and also the centre of either side; those at the ends support pediments, and at the sides level blocking-courses. It is erected of a fine-grained limestone, which, with all the materials of which the building is composed, is the product of the State. The interior surfaces of the walls are also faced with the stone. The principal floor is elevated well above the ground, upon a solid stylobate, and is approached by a noble flight of steps at each of the four porticos. From the elevated ground in the suburbs of the city an excellent view is obtained of the building. It stands with its whole height revealed above the roofs of the adjacent houses, and from the abruptness of the sides of the elevated ground upon which it stands, it has the appearance of being placed upon an artificially-constructed platform.

One of the residents of the city, who does not seem to appreciate the value of the building as a monument recording the greatness of the State, said that "its foundations were those of a cotton-factory, and the superstructure a packing-box surmounted with an imitation of the Choragic Monument of Lysicrates for a cupola." But notwithstanding, the general aspect of the building is good; and when the State of Tennessee has arrived at the summit of its commercial prosperity, over the greater portion of the journey to which it has now already travelled, some fine day a magnificent dome will be ordered to supplant the present restricted cupola, and then the State will have nothing more to desire in the way of a Capitol. The cost of the building and its approaches is said to have been about one million dollars. A bronze equestrian statue of Johnson, a duplicate of the one in Washington and the one at New Orleans, ornaments the grounds upon the easterly front. The State is to be congratulated upon the possession of such fine quarries as that from which the pedestal of this statue came; it is a creamy limestone, which takes a fine polish and preserves its color well.

The Senate Chamber, in which the Convention met by courtesy of the Senate, is a rather narrow rectangular room, with the dais and desk on the outward easterly side, and a stone gallery on the three other sides. It is hardly of a form to suit present requirements, but could be improved by dispensing with the end galleries and by giving advancing curved terminations to the ends of that which is in front of the desk. The audience gathered together on this occasion comfortably filled the room, and was composed of members of the American Institute of Architects, members of the Nashville Art Association, and quite a number of ladies. The address of welcome by Dr. Thomas A. Atchison, in behalf of the Art Association and the citizens of Nashville, was delivered with earnest feeling and emphasis, and the reply of Mr. E. H. Kendall of New York, Vice-President of the Institute, and, in the absence of President Walter, our presiding officer, was equally enthusiastic and acceptable.

After the reading of a letter from President Walter, explaining the unavoidable obstacles to his being present at this session of the Institute, the Report of the Board of Trustees and other Reports were read and referred, including the various reports of Chapters. Mr. E. G. Lind, of Atlanta, Ga., then gave an interesting address upon the "Harmony between Color and Music," which was profusely illustrated by colored drawings upon the blackboard, and by vocal renderings. In the afternoon a ride in carriages was taken about Nashville, for the purpose of viewing its principal buildings, in the course of which a call was made on the venerable widow of the late President Polk. The buildings visited were the residences of Col. Cole and Mr. J. P. Drouillard; the Federal Building, by ex-Supervising Architect Potter; the Watkins Institute; the First Baptist Church; and the Hermitage Club.

In the evening, after a call at the club-rooms, the members attended the reception given by the Nashville Art Association, at Dr. Ward's Seminary. A fine musical entertainment in the chapel, and an exhibition of architectural drawings in the art room, were highly enjoyed by all present.

On Thursday, 22d, business was resumed at the Capitol, with an accession of members who had arrived on the previous evening. A paper on "Architecture and Bacteria," by Mr. Glenn Brown, of Washington, D. C., was read by the Secretary, as also one by John H. Devereux, of Charleston, S. C.: the subject of the latter was "The Construction of Houses to withstand Cyclones." A paper by Mr. T. M. Clark, on "Architects' Protective Associations," was also read by Secretary Mason, and an extemporaneous address by Mr. Jenney, of Chicago, was made, on the "Construction of Heavy Buildings on Compressible Soil," with illustrative diagrams on the blackboard. A report of a committee was adopted recommending that all designs, models, casts, photographs, books, etc., implements of the professions of architects and engineers, be admitted free of duty. It was determined to send a delegate to the Convention of the Western Association of Architects, at St. Louis, in November. The present officers of the Institute were re-elected.

The matter of the proposed "Law for the Erection of Public Buildings" then came up, and after discussion the report of the committee, with several amendments, was adopted. These amendments are as follows: —

The law to go into operation in ten days after its passage.

The Commissioner to be appointed without nomination by the Secretary of the Treasury, to hold office during good behavior, and only be removed by the President for cause shown.

The clerks in the Bureau to be in number and with salaries as provided by the law of 1875.

The certificate of the special architect, ordering payments, to be endorsed by the Commissioner.

The minimum rate of commission to the special architect not to descend below three per cent.

Superintendents not to have the care of more than one building at a time.

If the successful competitor in the competition for the best designs is found to be wanting in reputation for constructive ability and good business habits, then an associate architect to be appointed to act with him, who shall be unexceptionable in these respects.

An additional section (29) repealing all acts inconsistent with the law, and confirming those necessary to its fulfilment.

Also, another section (30) providing office accommodations, and transferring the books and papers of the present office to the care and control of the new Commissioner.

The draft of law was adopted as a whole, with power given to the Board of Trustees to consider any proposition in relation to it, received by a committee of conference which may be appointed by the Western Association of Architects.

The usual resolution of thanks for courtesies was adopted, the place and time of meeting of the twentieth annual convention was left to the Board of Trustees, and the Convention adjourned. After the adjournment the members assembled on the steps of the easterly portico and were photographed by Mr. Strack, a resident heliograt.[1]

In the afternoon the members were driven out in carriages about five miles to the stock-farm of General Harding; they were very hospitably entertained at his mansion-house by General Jackson, his manager, and shown over the grounds. The piazza of his house and a new spring-house, both built of stone quarried on the place, were very much admired, as were also the fine specimens of equine architecture in the stables.

In the early evening a large group of members were entertained by General and Mrs. Thurston, at their residence, where a fine collection of the more valuable mineralogical specimens and rare Indian relics were exhibited, together with an extensive cabinet of very rare coins and medals. Much interest was manifested in these collections and in the pictures that lined the walls.

The banquet given at the hotel in the evening was the crowning entertainment of the occasion, when the members of the Art Association fraternized with those of the American Institute of Architects,

[1] Orders for this photograph may be addressed to Mr. H. P. Thompson, No. 1 Berry Block, Nashville

and harmony reigned supreme. On Friday morning the architects left Nashville, thoroughly impressed with the heartiness of their reception, and departed towards every section of the Union. Those who were bound for the East arrived at their point of departure at New York at 7.30 P. M., Saturday, 24th, well satisfied with the results of their extended journey, and with an overwhelming sense of both the Northern and Southern expanded areas of our common country. O. P. HATFIELD.

CARVING AND FURNITURE.[1] — III.

THE SEVENTEENTH CENTURY.



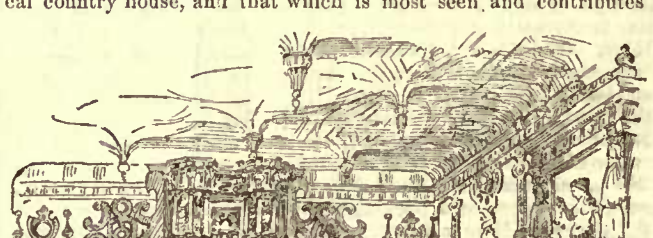
Confessionals. St. Paul's Church, Antwerp, Belgium. Late XVI Century.

LAST week I reviewed the carver's art in the period known as that of the Renaissance, the *cinque cento* of the Italians. In all that concerns our present inquiry the excellence of the period was so great, and the variety of graceful and beautiful decoration so inexhaustible, that I could do little more than point out a few examples, enough to stimulate curiosity, not to satisfy it. We see a few admirable examples of carved chests, seats, cabinets, and other furniture; fragments of screens, isolated columns, and so forth, in our museums; they are perfect as examples. But if you travel into Italy, the home and seat of these splendid works, it is not fragments, but entire interiors that will meet your eyes. Sets of church stalls, with figure-subjects behind each seat; screens, great book-desks, and other furniture. Churches retain what has once been erected within their walls. The walls and galleries of private houses have not been so fortunate. New generations have followed the fashion, and old carved furniture, if not broken, has been sold and dispersed. We find here a chair, there a cabinet; these are bought up. We meet them under our glass cases at Kensington and elsewhere, and wonder what may have been their history from the sixteenth to the nineteenth century.

We are now to consider the age that succeeded. The great master-workmen, who learned under sculptors and painters of well-known fame, and at the orders of the Florentine, Roman, Milanese, and other Italian princes, produced schools of carvers. They went north, east and west. Much of the early Renaissance carving in France and in England was the work of Italians encouraged to settle amongst us by Henry VII, Henry VIII., Mary and Elizabeth. It was natural that we, living on an island, and often at war with our nearest neighbors, should be among the last to feel the effect of a great European change. The sixteenth century in England was a very stormy time; society was going through a great change, and the new order of things had not settled itself into any regular condition. The new style of architecture was encouraged by the court and great men. There were new families risen to wealth and rank on the ruins of older stocks, and they built themselves palaces and houses in the new style. In the country generally it was different. Here and there families, from fear of proscription and persecution, lived in the quietest way in old manor-houses, in granges, or other houses of former tenants of monastic property; while great earls and barons still retained their old feudal castles and towers, and kept moats and drawbridges, uncertain when they might want such protection.

The second century was more peaceful. James the First was not war-like, and he did not encourage the jealousies of these great feudatories. He exhorted the landowners and squires to live on their estates, and to enjoy their gardens, their parks, and their forests, away from the intrigues of court life. We owe to the first half of the seventeenth century most of those noble country palaces, which have continued to our own times and are the glory of every county in the kingdom.

I draw a marked distinction between town and country houses. To understand the splendor, the conveniences, the wants, to be provided for in fitting them up and furnishing them, one should remember this distinction. In a great city — in London, for instance — society is headed by a king or a queen. As those personages are supreme in the State, so they override their subjects in social life. Great lords, however high their rank, ministers and merchants, however rich, are too many in number, and too equal as to dignity or fortune, to be of any special consequence individually. But they are far different when they own parks and woods and broad acres in Kent and Yorkshire, or Cheshire or Norfolk. They have elbow-room there, and fill places of honor, administer local affairs, and live for their friends and their neighbors. The hospitalities of London are rather what we term gaities than hospitalities. Houses are not of a size to take in poor relations and friends from a distance. There are hotels and lodgings on every side. The furniture of town houses follows the changes of fashion. There is less room for massive objects, such as presses and dressers, those fine monumental pieces which carry our memories back to other times. In the country house this bold carved furniture is in its place. And I take the seventeenth century as the period when country houses, as we now see them, were mostly built. They are not squeezed into a street or a square, nor carried up to numerous stories. They have plenty of space to spread out for such accommodation as may be required. They go more often by the name of halls than of castles or manors, though many of them stand where castles have been before, till such strong places were wanted no longer. This title "The Hall," was not given without reason. The houses of the early Middle Ages had but one room, the hall, and these old mansions retained it above and before all other features of the house. It was where neighbors and strangers, as well as the entire family, were entertained. It was close to the entrance, so that you might enter out of the night or the storm, and be welcomed at once with fire and food. These vast rooms retained very often the old mediæval timber roof and lantern. A passage was taken off the end of them, leading from the entrance-door to the body of the house, and giving access to the hall on one side, and the kitchens and offices on the other — a stately and convenient arrangement. These "halls," these old homes of hospitality, have retained the savor of the best and kindliest traditions of old English life. They have to this day a remarkable popularity. These old baronial halls, so stately, so full of repose, figure continually in romances and in the pictures of artists. Numbers of such country houses are continually being built, and I call attention to this fact, for, while architects seem at no loss for models and designs for the shell of such buildings, I rarely meet with anything like a design of interior woodwork of the hall that is really felt and carried out in the spirit of the old halls, numerous and varied as these constructions are. The hall, then, being the principal room of the typical country house, and that which is most seen and contributes so



Crewe Hall Screen, England. XVI Century.

much to the character of the mansion, it is worth considering the carving which will be most effective for its decoration.

The most important features are the screen which partitions off the entrance-passage or lobby, and the fire-place, and then the panelling of the walls. Any drawings or engravings of old country houses will show us examples of these features in great variety.

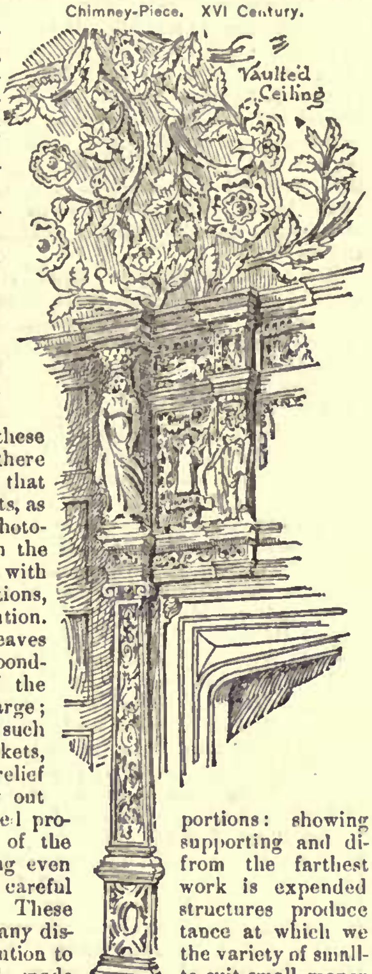
[1] A lecture by J. Hungerford Pollen, delivered before the Society of Arts, and printed in the *Journal* of the Society. Continued from Page 163, No. 510.

To begin with the screen. These screens of Elizabethan halls are not mere frameworks of panelling, such as we see in some old college halls, made during the reign of mediæval pointed architecture — simple reticulations — as, *e. g.*, at Hampton Court, but full of salient features. There are, in the larger screens, two entrance arches, a centre to hold a sideboard between, and corresponding spaces between these entrances and the side walls on either hand. There being a gallery or passage over the entrance leading to the first floor rooms, this gallery is fronted by an upper tier of arches. The entire structure is generally massive, full of striking features, coarse in execution, being carved by country workmen, but with a masterly feeling for effect and for the effective use of grotesque and bold detail.

Fireplaces came into general use in the sixteenth century. In earlier halls the hearth was in the middle of the room, and the smoke found its way to the timber roof, which it blackened, and then through the lantern in the centre to the open air. The more refined habits of the sixteenth century led to a better arrangement, and the fireplace was universally constructed in the wall, and the smoke escaped up a chimney. There, over the wide hearth, the finest carving was placed.

These chimney-pieces are in great variety. The more elaborate are complete architectural frontispieces, something like a triumphal arch in two stories, the lower on columns, or on bold carved pilasters sometimes baluster-shaped, with human heads and conventional shoulders, and then contracting towards the base. This is the old terminal figure of Classic sculpture in a dress suitable to the bold and massive character of the general woodwork of the Elizabethan style. The upper story rests on a broad and solid entablature, and is subdivided into three or more parts by columns, or by pilasters of similar character. Sculptured bas-reliefs, often of histories taken from the Scriptures, or compositions of an allegorical character, fill up these spaces. In smaller fireplaces there may be but one large panel, and that filled with heraldic achievements, as we have seen in some of the photographic illustrations thrown on the screen. None of this carving, with the exception of figure compositions, is of any very difficult execution. The solidity of the woodwork leaves room for, and requires a corresponding boldness in, the use of the chisel. The mouldings are large; the work on the salient parts, such as columnar supports and brackets, is in deep cuttings, giving full relief to the prominences; bringing out light and shade in well-measured proportions: showing the constructive arrangement of the supporting and dividing members, and suggesting even from the farthest ends of the room that some careful work is expended on the spaces they enclose. These structures produce their due effect at once from any distance at which we can see them. I may call attention to the variety of smaller constructions of this kind, made to suit small manor and town houses, of which the seventeenth-century woodwork gives continual examples; many are found without carving properly so-called, the work of the joiner only. They are not supported by side columns and piers, but by an architrave stretching across the stone jambs of the fireplace from the panelling of the walls on either side; with turned columns resting on it, and with oval or circular panels in the middle, or a panel following the lines of a pedimental window or doorway. In describing some old mediæval chests the other day, I called attention to the ornamental ironwork which binds the angles and adds strength to locks and hinges. We meet this ideal frequently in the woodwork of the seventeenth century; straps with rounded nail-heads are found represented in extra thicknesses of material so as to give a certain decorative addition to joiners' work on which no carving properly so-called is to be found, or nothing beyond mere flat sinkings made by the carpenter.

Chimney-Piece. XVI Century.



I should weary you if I attempted to follow the varieties which may be noted in regard to these chimney-pieces of simple and economical construction.

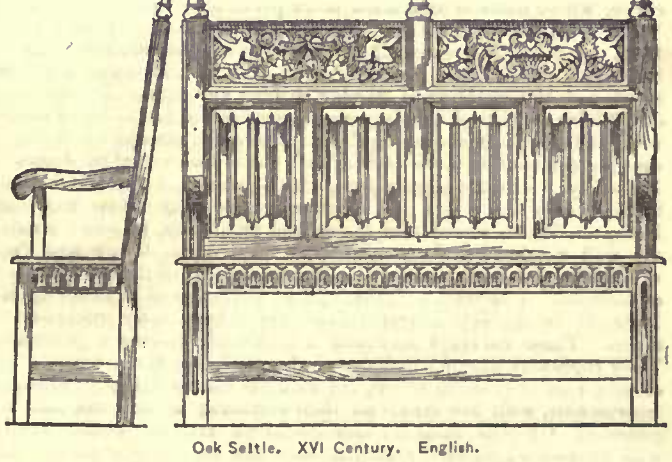
One more feature of old Elizabethan houses must be noted; I mean the staircases. If the halls are so grand a feature in the general disposition of the lower part of the house, the staircases which connect it with the upper stories are scarcely less so. Accordingly we find carving on stair balusters in great variety. Stairs being arranged generally in a square or oblong space, in order to have risers and steps as low in height and as easy of ascent as possible, have to be laid out with frequent turns and landings. The handrails have to come to a finish at each turn, and to start afresh at each new flight. The post which ends each set of rails is called a newel. Sometimes, for want of sufficient support to the flight above, the



Staircase. Aldermanton, England. XVI Century.

newels are continued from the ground to the upper flights. Generally the necessary support is found in the short pieces of floor which form the landings. The newels in many of these seventeenth-century houses are massive posts, carved with geometrical sinkings, with or without foliation, and surmounted by statuettes of human figures, animals, heraldic supporters and the like. At Blicklinghall, in Norfolk, these figures represent natives of all countries of Europe in their national dresses, carved in pear-wood with much spirit. Here are others taken from examples engraved in Nash's "*Mansions.*" They are some three feet high, and bear a due proportion to the newel-posts on which they are mounted. Then, again, as to rails and balusters. In many old houses the balusters are merely turned out of three-inch or three-and-one-half-inch posts, with bosses and neckings. The newels, too, surmounted by a turned ball or a reversed acorn. In houses of more pretension the balusters are arches, supported on terminal columns or square piers, the arches having bold key pieces carved in their centres, as in the figures thrown on the screen. The rail in such cases has the massive proportion of a beam, and the upper surface is scored by deep cuttings and bold roll-mouldings, to give life and lightness to the mass and afford convenient hold to the hand.

As to the furniture, the cabinets, tables and chairs of that age. The cabinets are architectonic compositions, answering to the chimney-pieces, with columns or pilasters on the angles, and the panels of the doors are carved with little reliefs representing the virtues, Prudence, Temperance, Justice and Mercy, Faith, Hope, etc.



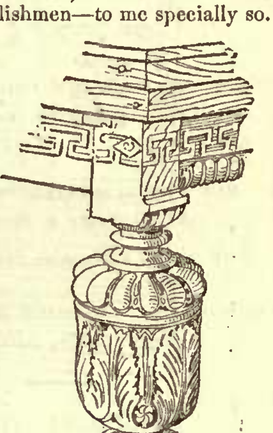
Oak Settle. XVI Century. English.

It is worth noting that these tall cabinets came in considerable numbers from Flanders. Mechlin seems to have had a special trade in these pieces of furniture, which it retains to this day, most of our modern Elizabethan furniture sold in Wardour Street being of Belgian make. In the seventeenth century the fronts were carved and put together, and were floated down the canals of the Low Countries to Bruges and Antwerp, and thence imported to Harwich and other ports on the east coast of England. The cabinets were completed by our own joiners, were copied, and the general fashion followed in

many parts of the country. Bedsteads, dressers and presses are still met with in old farm and manor houses, made at home from these imported models.

One more piece of furniture is noticeable from its effective massiveness, the table of the seventeenth-century hall. In the Middle Ages, the hall was put to so many uses that the tables were generally laid on trestles, which could be folded and removed after dinners and suppers. In the seventeenth-century halls they are no longer moveable, but are of one-and-one-half-inch oak plank, and stand on legs swelling into immense acorn-shaped bulbs in their middle. These bulbs, in good examples, are carved with acanthus work, and the upper frame of the table with interlaced strap-work.

These screens, fireplaces, stair balustrades and huge oak tables, seem to me essentials of the country-house hall, if it is to retain its old historic impress, so dear to most Englishmen—to me specially so. I have already noticed that piece of carving which is so effective on exteriors, the carved barge-boards which finish gable ends, so often required and so badly executed in these days. All the works here noted can be suitably carved by moderately skilled hands; excessive neatness, sand paper, and the varnishing brush are neither needed nor would they be in place in country-house work of this kind. A large number of such houses are in process of erection yearly. I have seen many. The notion of sending for five or six carvers, and finishing them really in the old manner, rarely, if ever, seems to be entertained. It seems to have passed out of the mind of our architects, yet it would not be more expensive than most of the costly joinery of the day.


Table-Leg. Leeds Castle, England. XVI Century.

There is a great deal to be said about Elizabethan wall panelling, the shapes and dimensions of its divisions, and the mouldings with which it is decorated; but I should exceed the time at my command were I to enter on this part of my subject. A change of great importance came over our own national architectural history under the influence of Inigo Jones, Wren, Grinling Gibbons, and their contemporaries. Jones was nearly thirty years old when James I, came to the throne. His education seems to have been Italian. He became known in this country through Anne of Denmark. It was in 1616 that he became surveyor and architect to the Crown. The Banqueting House in Whitehall is, as you know, part of his projected royal palace. Part of Greenwich Hospital, public buildings in one or two parts of England (the Town Hall at Abingdon, I rather think, is one), and several private houses are from Jones's designs. Amongst his private houses, Wilton House, near Salisbury, deserves special mention; Barrington House, in Gloucestershire, is another. Palladio seems to have been his favorite master. His architecture, is simple, bold, massive. It gives but little opportunity for the carver beyond admirable moulding and cornice acanthus work. You trace certain favorite details, viz., three acanthus buds or flowerets, which bend over the brackets of his chimney and ceiling cornices. Other peculiarities would also be observed by any carver whose task it was to supply damaged portions of the carving he allowed about his architecture.

Wren was the next great light of architecture in England. The carver whose name is associated more particularly with the name of Wren is Grinling Gibbons. He was first beard of by Evelyn, in 1670. A pot of flowers which he did outside of his window in Belle Sauvage Court was so delicately carved, that the leaves and blossoms shook with the rumbling of passing coaches and carts. The carving of Gibbons consists of hanging-swags, composed of fruits and flowers, with birds and animals among them. There are examples to be seen over the communion tables of St. Paul's Cathedral, and of St. James's, Piccadilly, where the marble font, with figures of Adam and Eve, is by him; over the doors and chimney-pieces of the state rooms at Hampton Court, where also the carved mouldings, by other hands, are well worth careful examination. Chatsworth House and Petworth House, in Sussex, have excellent examples of the best carving of Gibbons. I showed a photograph of a portion of the carving at Petworth in my first lecture. Here are others more successfully taken. These carvings surround a series of full-length portraits. They represent hanging trophies of the attributes of the seasons, including ears of bearded wheat, cut with the utmost delicacy; musical instruments, with low reliefs on their surfaces; medals, one said to represent Gibbons himself; lace Steinkirk cravats; classic vases, with figure-work on their sides; an immense variety of objects. All these, finely as they are cut, are not left without substance at the back; and this apparent undercutting, without loss of sufficient solidity and unity with the mass to which the prominent parts belong, should be well studied. It has been impossible to do justice to this aspect of the work in a photograph, or to show where direct imitation of nature has been avoided. It must be borne in mind that conventions are resources by which the artist suggests all that he has to teach the beholder, and so as to satisfy him, yet without overstepping the limits within which his art is necessarily confined. These conventions are justified by their effects. Carvers will do well to study the conventions or treaties between the art of carving and the impossible, which have served the purpose of so consummate an artist as Gibbons. His work was generally executed in limewood. He died in 1721, and left a school of excellent pupils, to whom we owe the fine fireplaces, door-heads, picture and looking-glass frames of the first half of the last century.

It is to be observed that the more correct and Italian architecture of Jones and Wren, stately as it is in churches and great public buildings, is cold, sometimes dull, when compared with the vivid and dramatic inventiveness of the earlier years of the century. I am speaking here of their interiors only. The beautiful carvings of such an artist as Gibbons would set off any wood-work. But it is a sort of parasite, an extra, added to the current lines and proportions of the architectural woodwork, not an integral part of it.

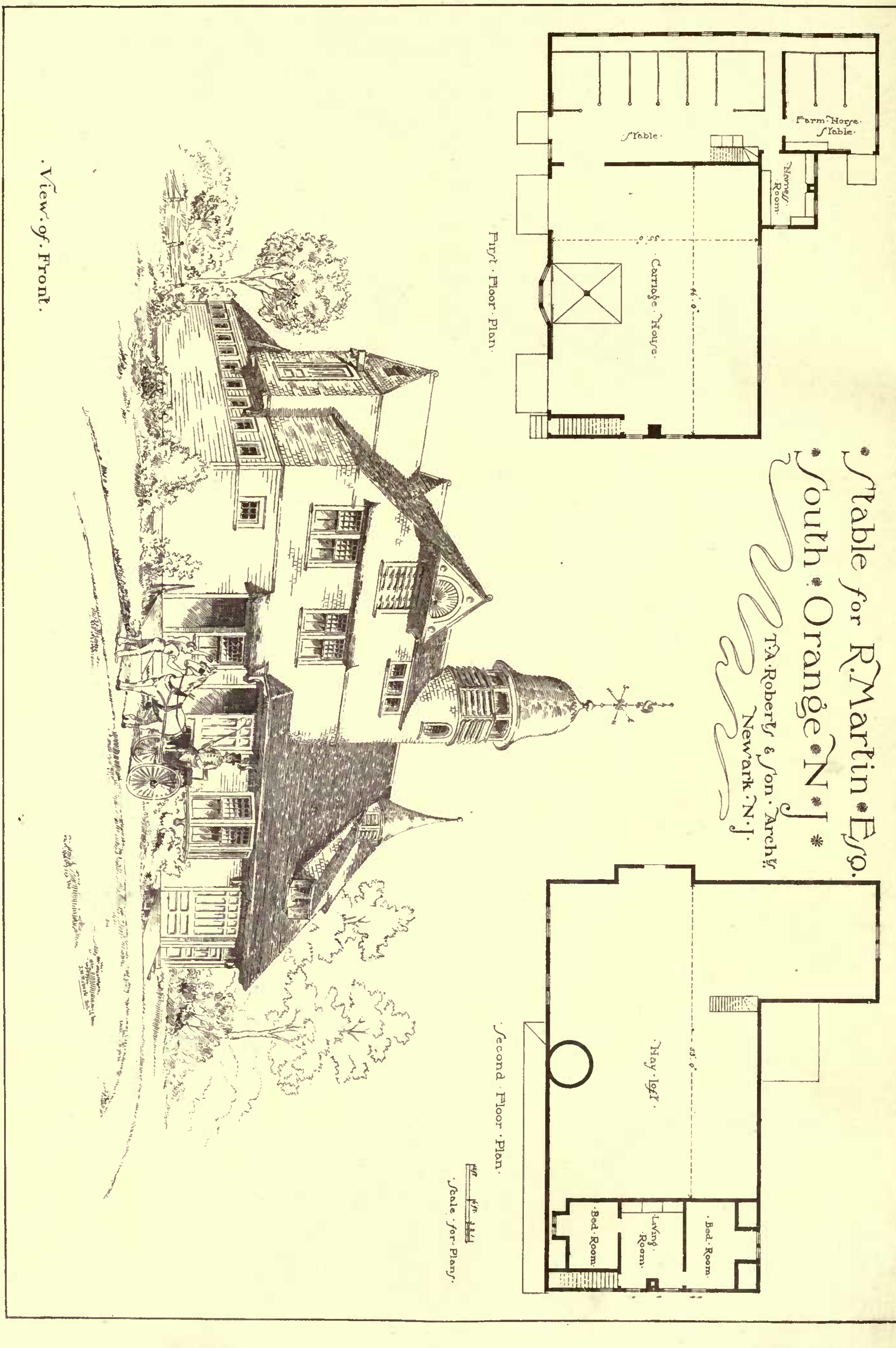
Something ought to be said of the out-door furniture of those days. We alluded to the rumbling of coaches. In the days of the Stuart kings, of Louis XIV of France, such means of conveyance had become of general use. Henry IV was stabbed by Ravaillac in his coach, but it was the only one he had. Louis XIV, we are told, met our King James, when he took refuge in France, with a cavalcade of a hundred. The Stuart kings, and the potentates of their day, drove about London and went down to their country estates in coaches, beautifully carved and gilt. If you desire to see the only example to which I can point of the coach of the seventeenth century, go and see that of the Speaker, at Westminster. It is mounted on four groups of allegorical figures. The frame-work of the body is of oak, carved with foliage and figures, almost detached. Figures of the virtues are placed on the angles. Allegorical figures support the driving box and the hind standard from which the body is suspended. I have given a full description of it in "Ancient and Modern Furniture." In my judgment it far surpasses any of the ceremonial coaches still used in state processions. It is said to have been used by Oliver Cromwell.

Besides the carriages, we should remember what frequent use was made of boats. Hampton Court, Greenwich, Whitehall, were all palaces actually on the River Thames, and the Court made regular use of the river as a highway. The beautiful ceremonial barges of the Lord Mayor and the City companies have ceased to row up and down the river. They are handsomely and effectively carved. What have the City Corporations done with them? They are worth house-room in their great halls. What was carved in small on Thames barges figures still more effectively in the old designs of ships of the Royal Navy. Figure-heads, stern windows, decorative leaf and scroll-work round the upper posts of the ships of the time of the Charleses and James, have dwindled down to a band of cable carved round the royal yacht of the present reign.

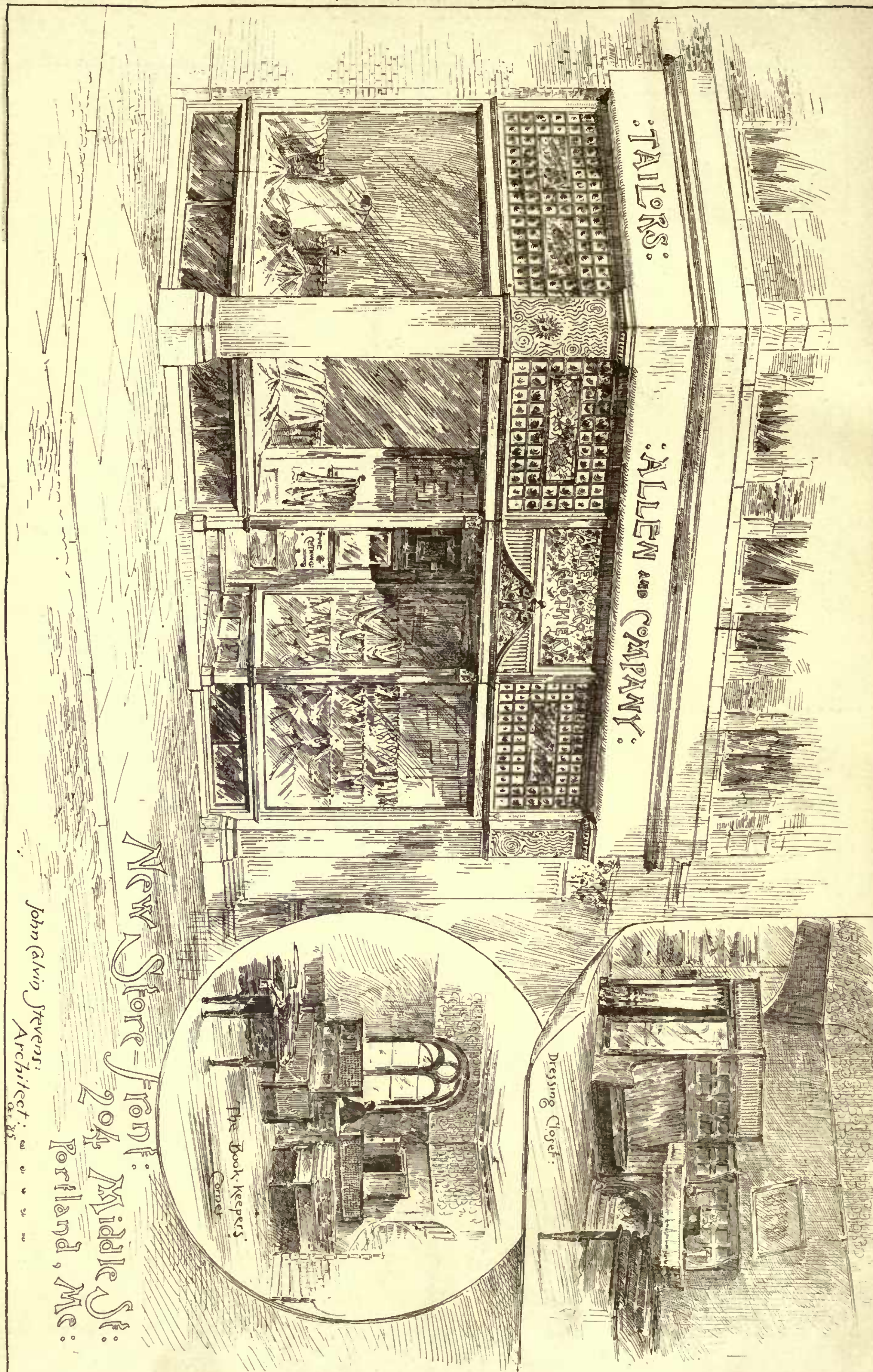
During a great part of the seventeenth century, Louis XIV, or the Great, as he loved to be called, reigned in France. In the arts of peace and war his country held, perhaps, the greatest place in Europe. He was the figure-head of the great European family in all matters regarding ceremonial splendor and court life. His palace and gardens, his court festivals, his carriages and establishments were on a large scale, and went far to set the fashion to neighboring nations. We owe much of the large, bold, but somewhat cold interior fittings of our town houses to the pompous manners and stiff ideas of this great man. However, in the matter of furniture, there are two or three broad features worth noticing, which distinguished the times of Louis, and set corresponding fashions going among ourselves. First the great use of silver. That metal found its way in great quantities from Spanish America into Spain, and into all provinces under Spanish dominion; the Low Countries, for instance, and the kingdom of the two Sicilies. We find in Louis's reign that table plate of massive proportions came into use among rich French families, and the same may be said of our own country. Not only table plate, but tables, mirror-frames, and other furniture were made of silver. A massive frame of this kind belongs to the Queen, and is at Windsor Castle. The furniture of Whitehall, even the toilet services and basins in the bedrooms of gentlemen and ladies of the Court, were of silver. Much of it, both from the royal and private houses, found its way to the mint and the melting-pot during the Civil Wars.

Another fashion that much concerns our subject was the use of large sheets of looking-glass. Silvered plate-glass, with bevelled edges, sometimes with little figures cut on the surfaces in intaglio were first made in Venice. For many years these mirrors were of small dimensions, five feet being the largest. Indeed, till late in the seventeenth century, large looking-glasses were made up of several separate pieces, the divisions between the plates being covered by subordinate lengths of gilt mouldings within the general frame. Louis covered the walls of his great *salle* at Versailles with looking-glass panels. A great variety of enclosing frames were designed for these large glasses. Some are of pieces of plate-glass, white and colored, cut into curves and other shapes, and fastened by brass pins through minute holes drilled with a diamond. Generally, looking-glasses were enclosed in frames of wood, carved and gilt. A quantity of carving designed and prepared especially for gilding became a prominent feature of interior furniture, in Louis XIV's reign in France and other countries. The work of the Italians, in Florence and in Venice particularly, is bolder, more graceful and more massive in general character than that of the French, but is rarely heavy. That of French carvers, on the other hand, is lighter and somewhat more gay.

The name of Louis Quartorze is commonly given to a style of light,



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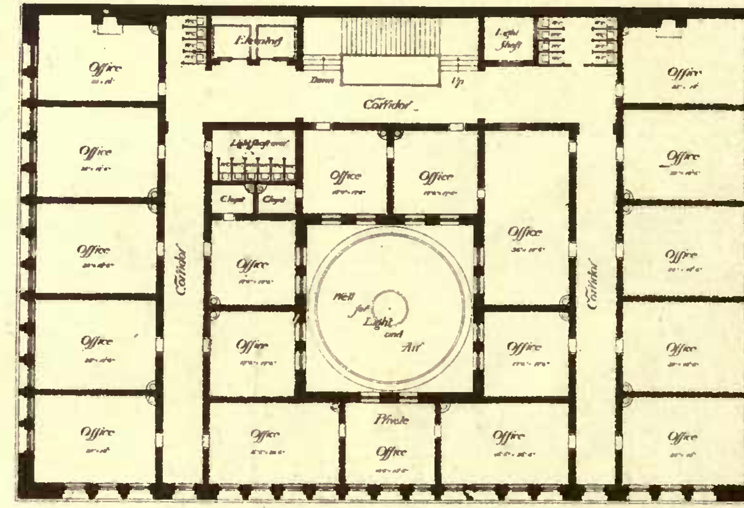
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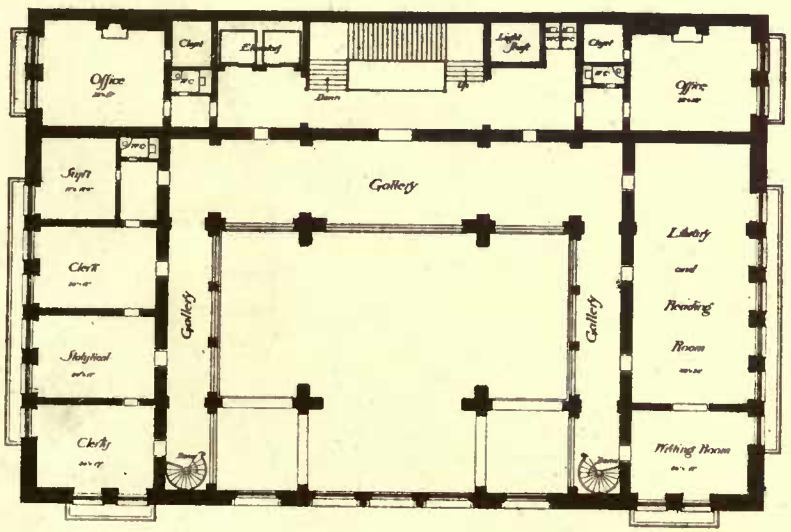
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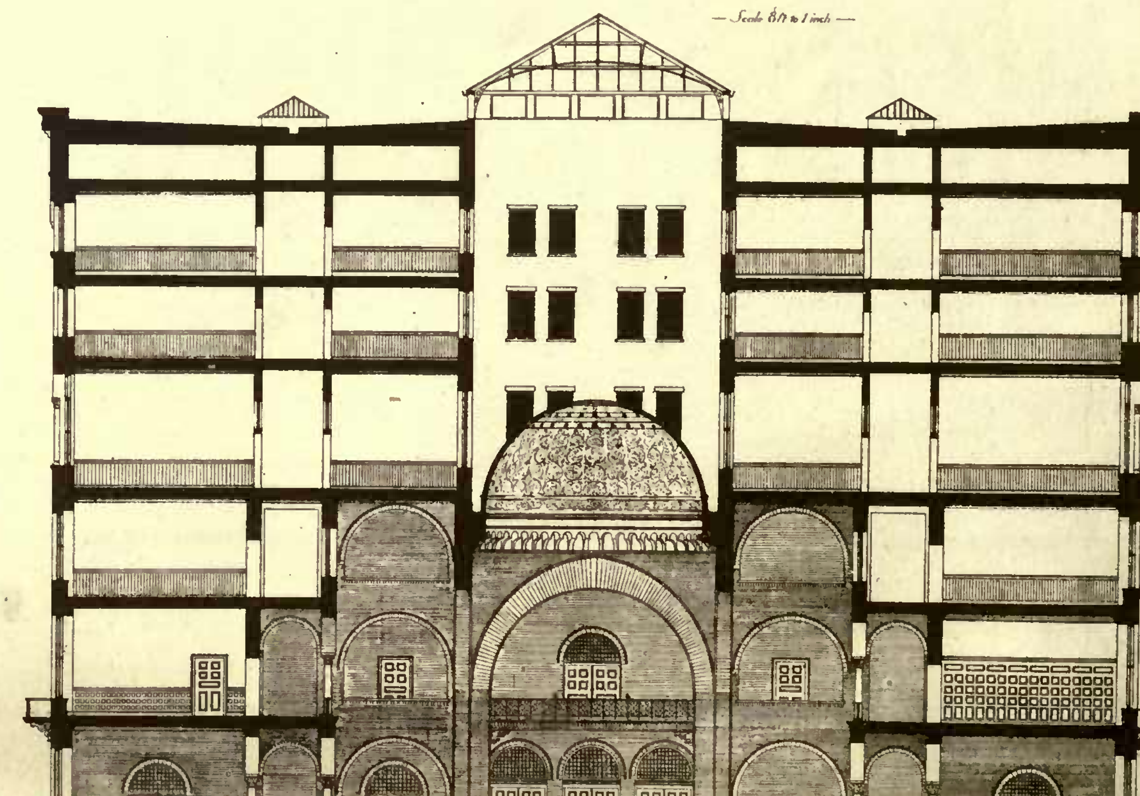


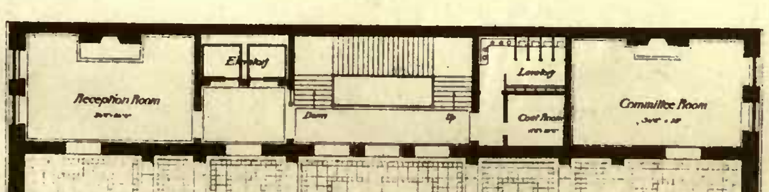
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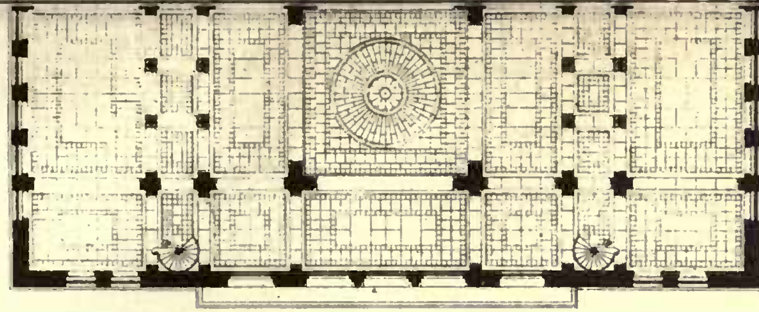
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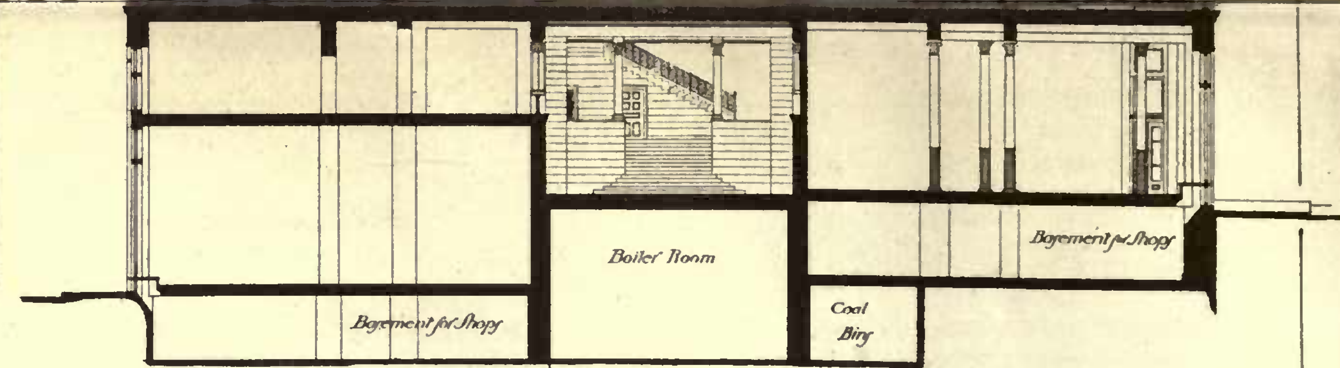
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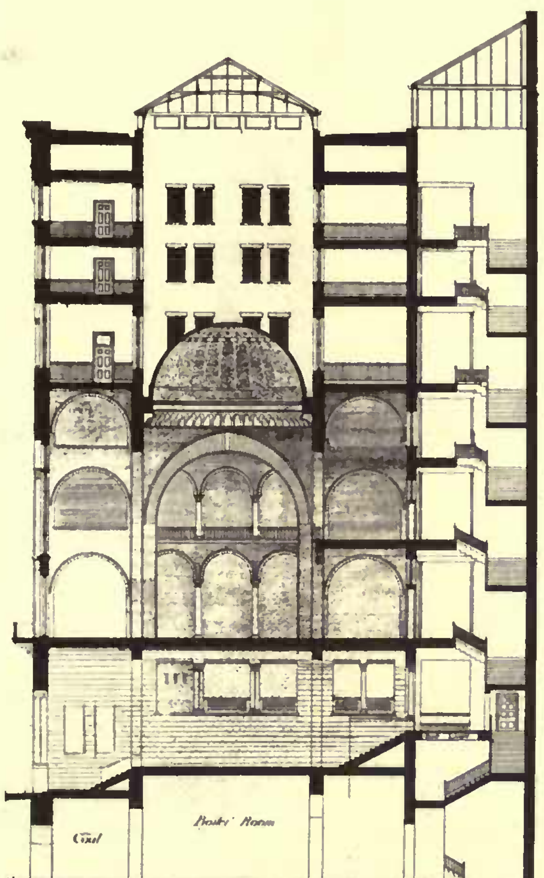




—Plan of Hall Floor—



Longitudinal Section.

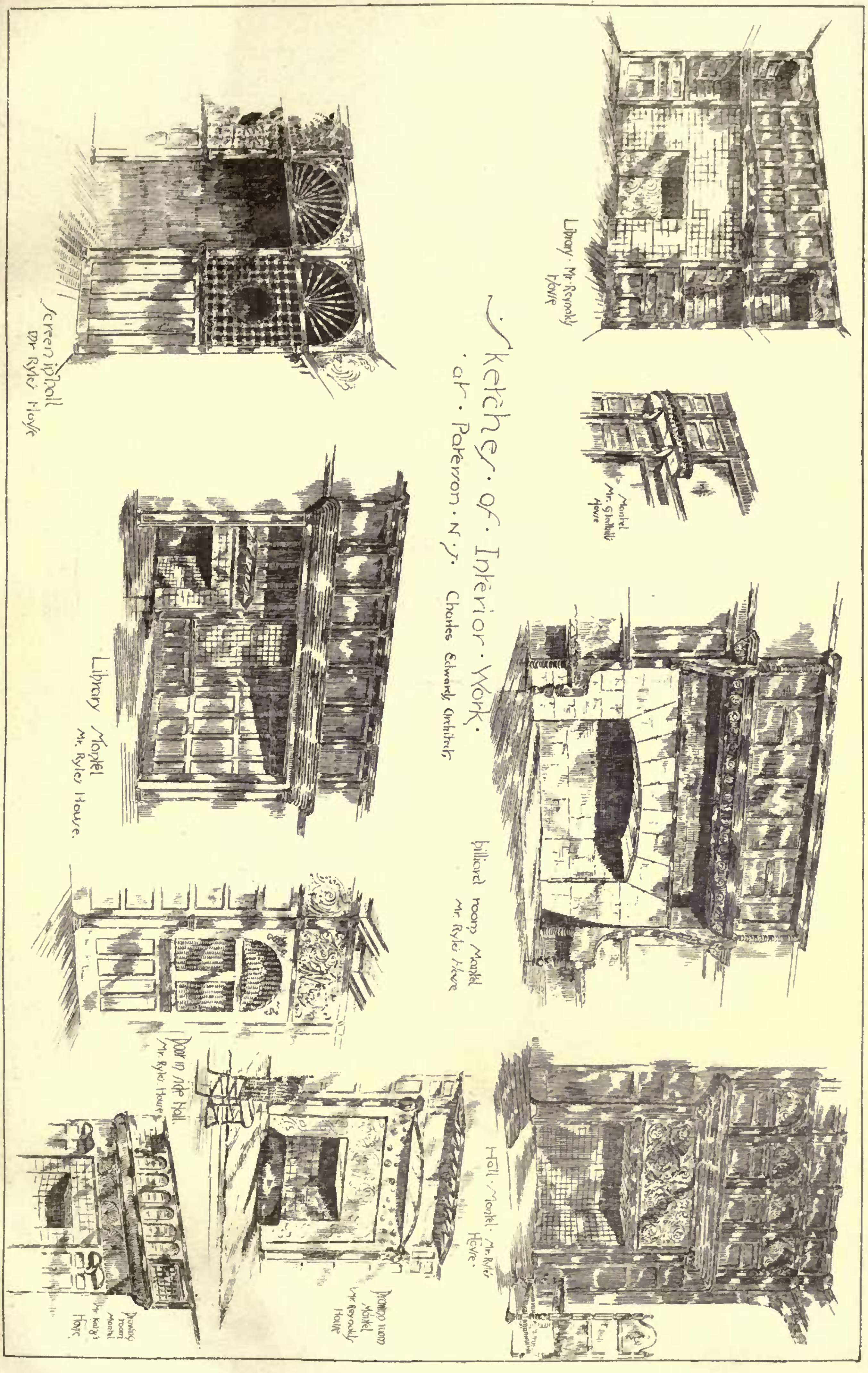


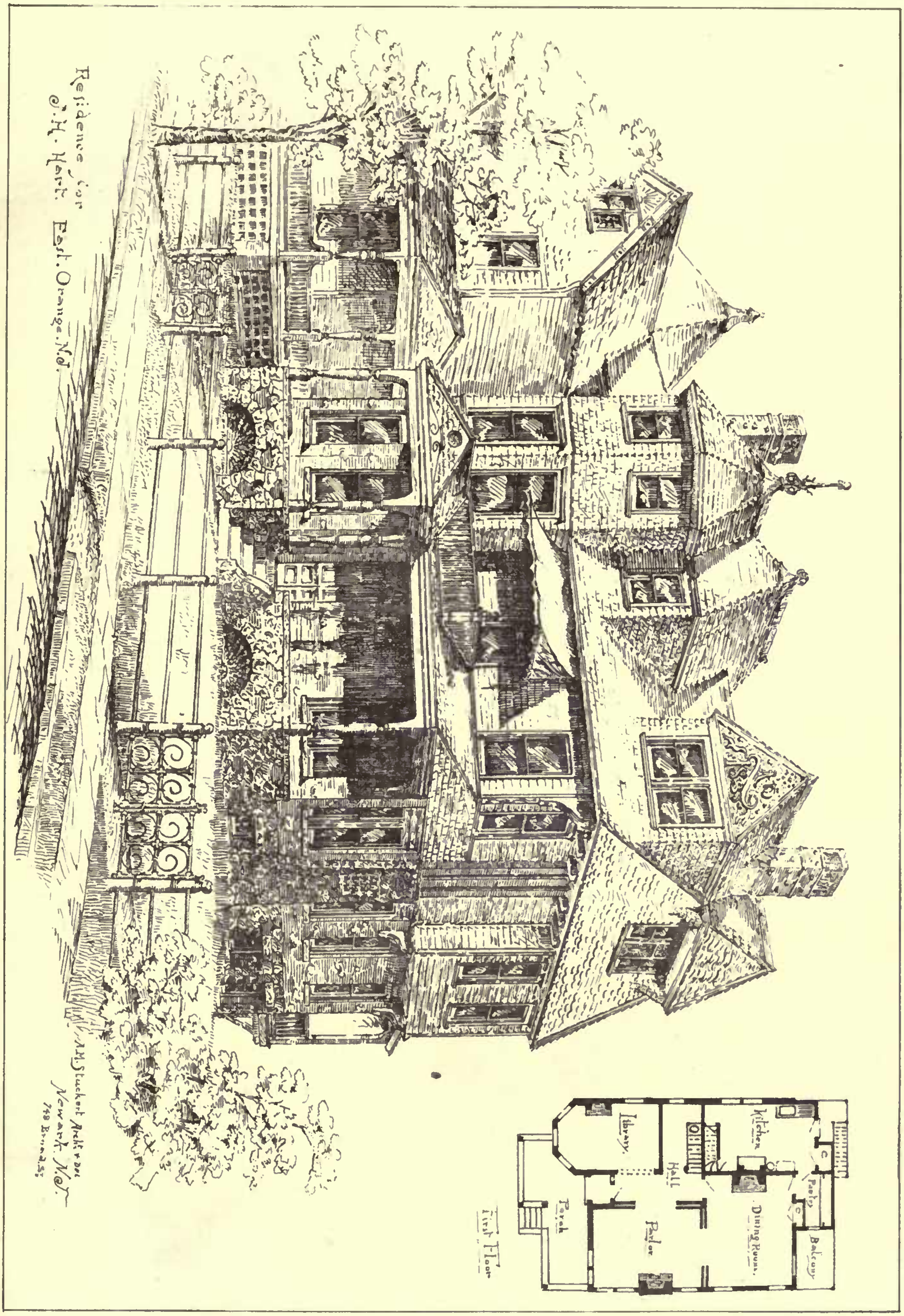
Transverse Section



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Elevation on Vine St.

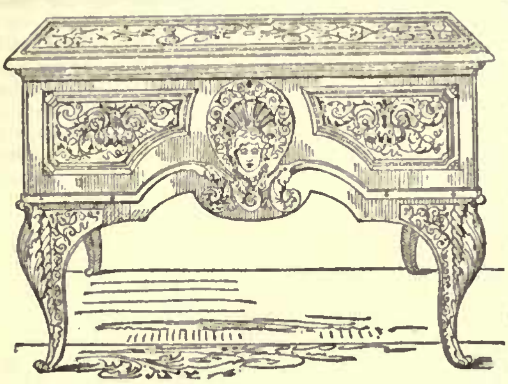

Sketches · of · Interior · Work · at · Paterson · N · J · Charles Edwards Architect
Library · Mr Reynolds House
Mantel Mr. Gledhill's House
Screen in Hall Mr Ryle's House
Library Mantel Mr. Ryle's House.
Billiard room Mantel Mr. Ryle's House
Hall · Mantel · Mr. Ryle's House.
Door in the Hall Mr. Ryle's House
Drawing room Mantel Mr Reynolds House
Drawing room Mantel


Residence for
J. H. Hart. East. Orange. N.J.
A. M. Stuckert Archt & Del
Newark. N.J.
749 Broad. St.
Library
Kitchen
Hall
Pantry
Dining Room
Porch
Parlor
Balcony
First Floor

somewhat affected and fantastic curvature, which properly belongs to the fashions of a later reign, a less severe system of manners, and times altogether irregular, and showing signs of decay and corruption. But the better art of this kind is exercised in the graceful use of the acanthus leaf, placed so as to form luminous breaks and diversions from the monotony of mere lines of moulding. Picture-frames of the time have broken corners, carried out on each of the four angles of the frame; they are sometimes called hammer-headed. We know them also as Vandyck frames, as most of the pictures of Vandyck are mounted in this fashion.

But besides gilt mirror and picture frames, furniture, such as tables, chairs and sofas, began to be carved and gilded in the same way. Tapestries specially designed for the backs and seats of chairs were upholstered on these gilt frames. All this kind of furniture received a wide development in the century that followed.

Another invention belonging to the seventeenth century is that furniture which takes its name from Boulle. André Charles Boulle was born in 1642; he was employed on the furniture of the palace of Versailles. His work, whether he invented it or not — for there are some grounds for doubt — is a particular kind of veneer made in tortoise-shell, and very thin brass. The designs of his cabinet fronts are partly borrowed from the outlines of antique Roman altars. In those cases salient ornaments in brass works, cast and tooled with the graver are superadded. These mounts are massive when compared with the fine lines, reticulations and pattern-work of the general surface. They are masks, or volutes, or claw feet. Sometimes they represent medals, casts taken from the commemorative medals struck in honor of victories and other events of the king's reign. Veneers, as you know, are thin slices cut by watch-spring saws through two thicknesses of wood or one of metal, and the other of shell. A double set of grounds and two sets of patterns are so produced. They are counterchanged, and then fastened with thin glue on the wood below. Great pressure is used to exclude the air and maintain perfect cohesion between the veneer and its bed, till the glue is entirely hardened. The brass-work is further secured by fine pins of the same metal, the heads of which are afterwards filed down to an even surface with the rest of the work, and chased over. Perhaps, no furniture, during the period we include under the name of Renaissance so nearly resembles the splendid metal furniture of antiquity. The work is produced by modern cabinet-makers, generally imitated from old pieces, but the cost of production is heavy. The prices at which two old upright presses of the seventeenth century were sold at the Hamilton sale (£7,000 or £8,000 each, I believe) are the measure of the value in which these monumental objects are still held. There are many fine examples in the galleries of the Louvre, in Windsor Castle, and in private hands in this country. In my next lecture I hope to show photographs of several. Other veneered furniture was made in abundance throughout the century in Italy, Germany, and in this country. There is one Italian artist, A. Pietro Pifetti, a Piedmontese, who worked in a similar way to Boulle. He used ivory, mother-of-pearl, colored woods and brass. He was only born in 1700, but I mention him here as his work is, in many ways, allied to that of Boulle. His works are well known in Turin, but genuine pieces by his hand are rarely met with in this country.


Boulle Commode. XVII Century.

Veneering in wood, known under the name of marquetry, had been made from before the sixteenth century in Italy; sometimes in one wood—pine—the grain of the wood being so set as to help the design, and a certain amount of shading added by means of hot iron. Some good panels of this kind can be seen in the large North Court of the Kensington Museum. Other kinds consist of architectural elevations and interiors, little figure-compositions done in veneers of lime, pear and other light-colored woods, occasionally helped by artificial staining. They are common in the marquetry furniture of northern Italy of the seventeenth century. That sort of decoration became common in England after the Revolution, when Dutch workmen and Dutch furniture found their way into the country. Till that time the general decoration of our furniture was due to the carver, as it had been from immemorial custom. Down to the close of the century country houses maintained their old character, the palaces and public buildings of Jones and Wren notwithstanding. Massive staircases, solid furniture, decorative panelling, continued to be made. Every country town could furnish workmen competent to do the wood-work, and to prepare for the carving that might be required. The severer lines and proportions of Wren were more in fashion in London and amongst court personages than with the squires and landowners that made up the wealthy middle classes that were the backbone of the country.

THE ILLUSTRATIONS.

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

NEW STORE FRONT, MIDDLE STREET, PORTLAND, ME. MR. JOHN CALVIN STEVENS, ARCHITECT, PORTLAND, ME.

THE drawing represents part of the work done in altering an old bank building. The front first story was taken out and the new front put in. About $4,000 was spent upon the work.

HOUSE OF J. H. HART, ESQ., EAST ORANGE, N. J. MR. A. M. STUCKERT, ARCHITECT, NEWARK, N. J.

COMPETITIVE DESIGN FOR THE CHAMBER OF COMMERCE, CINCINNATI, O. MESSRS. E. M. WHEELWRIGHT AND A. G. EVERETT, ARCHITECTS, BOSTON, MASS.

STABLE FOR R. MARTIN, ESQ., SOUTH ORANGE, N. J. MESSRS. T. A. ROBERTS & SON, ARCHITECTS, NEWARK, N. J.

THE cost of this stable is about $6,000.

SKETCHES OF INTERIOR WORK, PATERSON, N. J. MR. CHARLES EDWARDS, ARCHITECT, PATERSON, N. J.

ARCHITECTURE AND BACTERIA.[1]


Brick Panel. by. James. Brown. Lond: Eng:

MUCH has been written and published in a careless and offhand manner about germs and germ-diseases. Houses are liable to the invasion and habitation of these micro-organisms, therefore the exact status of bacteria as they relate to building should be interesting to architects. Usually architects have little time for examining and culling the literature on the subject, cleaving to what is good, throwing aside what is bad. In this paper I shall attempt briefly to point out when, where and how bacteria may become objectionable in architecture, and what provision for their exclusion should be made by architects.

The literature on the subject is great in amount, small in exact and practical information. Pasteur in France, Koch in Germany, Klein in England, and Sternberg in the United States have been the most successful practical investigators into the form, habits and pathology or disease-producing qualities of bacteria. For zeal, honesty, care and experience they stand ahead of all other investigators on the subject.

These plants (it is established that they are not animalculæ, but algæ or fungi) do not appear larger than a pin's head when magnified seven hundred diameters. To the natural eye they are of course invisible. Bacteria are transported by the air and water, above and below ground. When deposited on a proper substance they thrive and multiply by millions. They breed by spores and fission or division. One will produce two in one hour, four in two hours, and so on by progression. Cohn estimates that one would increase to sixteen million and a half in twenty-four hours, roughly speaking.

Dead organic matter furnishes the food on which they thrive. Sternberg says they must have water (or moisture), nitrogen, carbon, oxygen and minute quantities of mineral salts. Bacteria have the power of eliminating these elements from dead organic matter and appropriating them to their own use, thus separating everything into its elementary gases and producing what we call putrefaction. Every bit of decaying matter literally swarms with myriads of these micro-organisms.

All species of bacteria are killed at a temperature at or below the boiling point (212° Fahrenheit). When an infected substance (say impure water) is boiled, steamed, or subjected to an equally high temperature, the bacteria are destroyed. Although not killed by cold at or below the freezing point, they remain quiescent and do not increase in number. That the spore of bacilli (a branch of the bacterian family) are killed by boiling an hour or more I think has been established without doubt by the investigations of Klein. There is no doubt that the spores are not killed by a few minutes' boiling, and a few reputable investigators contend that they are not killed no matter how long they are subjected to a boiling temperature.

The spores are the hardiest of micro-organic life. When placed on a proper culture material, and subjected to the proper temperature, they immediately (in an hour or so) produce their specific kind.

[1] A paper by Mr. Glenn Brown, A. A. I. A., read at the Nineteenth Annual Convention of the American Institute of Architects, held at Nashville, Tenn., October 23.

Are all bacteria dangerous?

The unanimous answer to this question is, no. The different species — and they are very numerous — of putrefactive bacteria are harmless on living organisms. The common opinion is, and scientists have held the same opinion, that putrefactive bacteria could at any time turn into or produce a disease-germ. Several instances are on record where putrefactive or non-pathogenic bacilli (rod bacteria) have been supposed to turn into pathogenic or disease-producing bacilli. Experiments seemed to have proved these cases. Klein by careful work has proved these investigators in error. He concludes that definite micro-organisms of the outside world have power to produce definite diseases when introduced into a suitable animal. This power they have in themselves. Those that do not possess it cannot acquire it by any means whatsoever. As certain species of plants act as poisons to the animal body, and other species of plants, which, although belonging to the same group and family, and very much like others, have no such power and cannot acquire such power by any means, so there are disease-producing bacteria and others which are quite harmless. The latter remain so, no matter under what conditions or how long they grow.

A building should be guarded against all sources in which common or putrefactive bacteria thrive, as in the same place or matter disease-producing bacteria would multiply indefinitely if one should be deposited in it from any infectious matter. Thus the chances of infection would increase from one to a billion in the short time of two days. The more public the culture material, the more danger there is of its becoming infected with disease-producing bacteria. A building, then, is most liable to danger from polluted ground and sewers.

The earth around and beneath our houses is polluted by currents and sheets of subsoil water that carry matter from cesspools, made-ground, leaky sewers, cemeteries, etc. The sources are spread frequently over a wide area, and may have specific disease-germs multiplying and flourishing in them. How far does the soil filter or remove these bacteria from ground-air and ground-water? Infected matter two feet below the cellar or footing courses would be harmless if we only had to fear its conveyance by ground-air. Ground-air has all bacteria removed by passage through one or two feet of earth. This has been proved by Professor Pumpelly's experiments, made under the auspices of the National Board of Health. Ground-water coming from the same sources, if it were contaminated, would carry infection with it. Professor Pumpelly says if the drift of leaching (from cesspools) be towards the cellar it may be extended into or to the surface of the cellar during wet seasons. From the walls and floors after evaporation the bacteria will be carried into the atmospheric circulation of the house.

For this reason I would say abolish cesspools and substitute earth-closets or subsurface irrigation in the country, and the water-carriage system in the sewered cities. If the ground is damp, drain it to at least two feet below the foundation walls. If the cellar is on made-ground, protect the cellar walls and cellar bottom by one continuous coating of asphalt laid over an inch coating of cement and sand. The least porosity in building materials for the foundations, the better they are under the circumstances.

Bacteria from the cold-air duct would be destroyed in the hot-air chamber of the furnace when the heating-apparatus is in operation. The injurious effect of gases generated in the heating-apparatus must not be confounded in any way with bacteria. The heating-apparatus should always set above the level of the cellar bottom. Particles of decayed organic matter with moisture are liable to collect in the pit often made for furnaces. The warmth, moisture, and dead organic matter would form an excellent cultivating material for bacteria.

Sewers are the most fruitful channel of communication for bacteria, as in their ramifications they connect each house in a city with all or nearly all the other houses. In this way infectious bacteria from one sick man may be brought or given communication with thousands of houses and their residents if they are improperly plumbed. Disease-producing bacteria are not always present in sewage. Long periods may intervene during which no harmful bacteria are present, but when they are deposited or find access by any means, they would find abundant material for multiplication, no matter how clean the sewer might be. The most cleanly sewer is far from being free of deposit.

Dr. Carmichael and others by experiments have proved that a water-seal is a positive safeguard against the passage of living micro-organisms; hence a running trap with a water-seal is the simple method adopted to keep bacteria and sewer-air from our rooms and from our houses. First disconnect the house and the sewer by a running trap. This trap is often omitted by plumbers and a few sanitary engineers who desire to ventilate the sewers through the individual houses. The best argument, I think, for the use of the running trap between the house and the sewer is that it protects each house from infectious bacteria that may come from some of the many houses connected with the sewer.

It is true that if plumbing systems are properly jointed, ventilated and trapped there is little danger, even if bacteria should be wafted from the sewer into the house system. Why run the risk of even that little danger. Few of our plumbing joints are perfect, and open joints may sometimes occur from settling after the building is in place. In the second place, as the inside sewerage system of the house is never free from putrefying deposits, although the amount is small in a properly-constructed system, water-seal traps are put under all plumbing fixtures, and bacteria that may be breeding in the pipes are thus kept out of the rooms. When cut off by the running trap from the city sewers, disease-producing bacteria can only get into the house system by local contamination.

Locally material, or matter on which bacteria can live and multiply, most often accumulates in the kitchen and bath-room. Particular care should be exercised in the construction of the walls and arrangement of plumbing fixtures in these rooms. The inside surface of walls should be as impervious as possible, so nothing can be absorbed, and so they can be washed with soap and water. Glazed tile or enamelled brick are to be preferred. Common brick coated with paraffin is suggested as an impervious coating by Dr. Ogden Doremus. For a cheap coating soapstone-finish is good. Never use boxed sinks, tubs, closets or pipes, as bugs and dirt are sure to collect in the dark corners and cracks provided no constructed; the dirt forming a proper breeding-place for disease-producing bacteria, if by any means they should come in contact with it. The tongued-and-grooved wainscoting so common in cheap bath-rooms and kitchens should be abolished, as forming cracks for dirt.

Masses of filth in the shape of cesspools, even in the cellars and adjoining the cellars, or imperfect plumbing with no traps under fixtures, are on record as having been in houses for years and the inhabitants were healthy. Does this prove that such things are not dangerous? No; it simply proves that no specific disease-bacteria have found their way into the mass, and that it has only been inhabited by harmless putrefactive bacteria. When this matter becomes infected or contaminated, every germ deposited will multiply as stated before, sixteen and a half million in twenty-four hours. The occupants of the house would most probably escape the one or two but would not escape the millions or billions produced in a few days.

Complete proofs have been furnished by the separate investigation of scientists to fix the causation of certain diseases on specific bacteria. Carbuncle, swine-plague, erysipelas and consumption are named by Klein as undoubtedly caused by bacteria. Diphtheria, scarlet fever, typhoid fever, and other fevers, cholera, leprosy and a host of other diseases leave little room for doubt in attributing their cause to branches of the bacterian family.

Disease-producing bacteria will multiply on living tissue; putrefactive ones will not. Putrefactive bacteria require only simple nitrogenous compounds on which to multiply, while disease or pathogenic bacteria require proteid or allied complex nitrogenous compounds. How they cause disease, investigators have not yet been able to show. What is known and proved should undoubtedly make architects careful without making them extremists. Doctors and sanitary officials have sometimes gone so far as to advocate the relegation of plumbing to out-buildings; such views are those of an extremist or alarmist. More harm is liable to come from exposure in passing from a warm house to a cold out-building than will ever arise from the plumbing in a well-plumbed house. Statistics show that the average of human life is longer since so many improvements or advances have been made in sanitary science.

TALL CHIMNEY CONSTRUCTION.[1]—VI.

TAKING DOWN CHIMNEYS.



Wro! Iron. Lamp. Bracket. by the St Pancras Iron Co. London. Eng.

THERE is an ingenious arrangement for facilitating the taking down an old chimney-shaft, which was employed, some little time ago at Messrs. Gilkes, Wilson, Pease & Co.'s Tees Iron Works, Middlesborough, and which was designed by the engineer of the works, Mr. Charles Wood. In consequence of the chimney-shaft, on which this arrangement was employed, standing in a crowded position, the plan of letting it fall was inadmissable, and it had to be taken down from the top.

The question was — how to get the bricks down with as little damage as possible, so that they might be used again for building purposes? Owing to the position of the chimney, the bricks could not be thrown down outside; and if thrown down inside, they would be smashed, or if lowered by mechanical means, the process would have been very tedious.

Under these circumstances, the question was considered whether the bricks could not be allowed to fall by their own gravity; but, at the same time be cushioned sufficiently to break their fall and prevent damage. In order to do this, an air-tight iron box was placed at the bottom of the chimney; this box was fitted with an air-tight

[1] Continued from page 165, No. 510.

door, mounted on hinges, and closing on an India-rubber face, against which it was tightened by a wedge.

A wooden spout was then fixed on to the top of the box, and carried up to the top of the chimney; this spout was three-and-a-half inches by five inches inside, and was made of planks one-and-one-eighth inches thick, well nailed together, with a little white lead on the edges, thus making the spout perfectly air-tight. The spout was made in about twelve-foot lengths, and then were formed together by cast-iron sockets or shoes, and caulked round with tarred yarn, the whole apparatus costing about £6.

A few stays were put inside the chimney to keep the spout steady, and steps were nailed upon it by which the men could ascend. It will be seen that the whole of the spouting being perfectly air-tight, if a brick filled the spout perfectly, it would not descend; but, as the section of a brick is three inches by four-and-a-half inches, and the spout was three-and-a-half inches by five inches, there was a half-inch space each way, through which the air could pass the brick freely; this space further allowing for any irregularity in the size of the bricks. The result was that the bricks, being partially cushioned in their fall, arrived at the bottom without any damage whatever. As soon as the box was full, the mate at the bottom rapped on the spout as a signal to stop, and then opened the air-tight door, and removed the bricks which had come down. This being done, he again shut the door, and signalled to the man on the top to go on again. The man on the top lowered his own scaffold, and as the spout got too high he cut a piece off with a saw. If there was much mortar adhering to the bricks, it was knocked off before putting the latter into the spout, and it was allowed with any little pieces to fall inside the chimney, and was wheeled out.

The plan described is, I believe, quite new, and it is certainly most simple and ingenious. There are, no doubt, many circumstances under which it might be advantageously employed.

PROBABLE CAUSE OF FAILURE IN SOME SHAFTS.

Sulphate-of-Magnesia (Epsom Salts) is largely produced by the decomposition of mortar. In lime, burnt from magnesian limestone, the result is a mixture of lime and magnesia in varying proportions, which when slaked and made into mortar is very susceptible to the influence of sulphurous flames. These re-act, forming the sulphates of lime and magnesia. The great solubility of sulphate-of-magnesia facilitates its diffusion, and makes it the chief cause of defacement, sulphate-of-lime being comparatively insoluble. As the sulphate-of-magnesia dissolves and effloresces, the mortar is disintegrated. Sulphurous acid from coal burnt in houses produces its chief effects before it is diffused in the outer air. As it passes up through a chimney it finds its way through crevices and pores in the wall, and thus directly attacks the mortars, sometimes causing the fall of chimneys by eating out the mortar cementing them.

STRAIGHTENING A CHIMNEY BY PRESSURE.

The foundation of a furnace-shaft in course of erection by M. Dubosc, at Havre, had settled very irregularly in consequence of the very unequal resistance of the soil, and so quickly that it was found impossible to complete it. The upper part had consequently to be taken down again, and the completion of the remaining fifteen feet had to be postponed until the chimney had been straightened. This latter operation was effected in the following manner:—The soil on the side opposite the sinking was removed to a breadth of about four-and-a-half feet, and to the depth of the last stage of the foundation. Upon the lowest stage a number of piers leaning against the chimney-shaft were erected to the height of the ground level, and the semi-circular ditch thus formed was covered with radiating double T beams, which were protected against sinking in the soil by a layer of sleepers, and rested on the piers. Planks were then laid on the beams, and about 30,000 bricks were put on them. This one-sided weighting of the foundation had the desired effect of bringing the shaft back to its perpendicular position, the movement within six weeks at the top being nearly one foot, so that a deviation from the perpendicular was then hardly noticeable.

MOVING A CHIMNEY.

In 1872, at the Cabot Mill, Brunswick, Me., a chimney, seven feet nine inches square at the base, and five feet nine inches square at the top, containing upwards of 40,000 bricks, and weighing more than one hundred tons, was moved twenty feet, to make room for the enlargement of the mill, on the plan of Benjamin Greenes. The work was done by a process similar to that by which ships are launched, the chimney being slid along greased planks. It was moved, the flues connected, and the fires started in eight-and-a-half hours. The power used was two screw-jacks.

STANTON, NEAR NOTTINGHAM, IRON WORKS CHIMNEY.

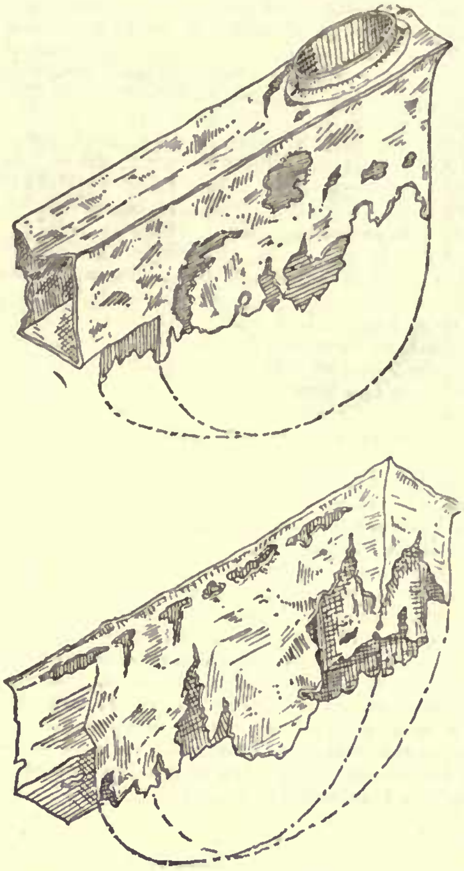
Height one hundred and ninety feet. Across the cast-iron cap, twenty-four feet. Weight of cap, fifteen tons. Across opening at top, thirteen feet, nine inches. Number of bricks used in construction, 420,000.

When finished in March, 1874, fifty persons partook of a hot dinner provided for the occasion on the top of this shaft. Accounts published at the time state that they sang grace, drank the usual loyal and other toasts, concluded with the "National Anthem," and all descended in perfect safety.

ODD BITS OF OLD PLUMBING.[1]— II.

CHEMICAL ACTION.

It is to be expected that a trap used beneath a plumbing fixture where chemicals are constantly being used will be found in a ruinous state. Figures 8 and 9 are given as curious examples showing the extent of chemical action. This trap was taken from beneath the chemical sink of the Polytechnic Institute, used by Professor Pepper in his experiments. Some fifty pounds of mercury was found in the ground beneath the sink, and for this reason alone the ruin is attributed to mercury. As mercury only forms a protective coating on the lead, the destruction of the trap must have been caused by some of the acids the Professor used in his experiments. Lead is not easily dissolved by acids, and for this reason is frequently used in manufacturing chemistry. Neither concentrated sulphuric, hydrochloric, nitric, or hydrofluoric acids will act on lead at ordinary temperatures. Nitric acid, specific gravity 1.2, is the best solvent. With a stronger acid an insoluble nitrate is formed, which protects the surface. Practically the whole of this specimen below the water-line is destroyed. It is free from deposit.



Figs. 8 and 9.—Trap taken from beneath the Sink of Prof. Pepper, Polytechnic Institute, London.

Sewer-air has frequently been mentioned as the cause of failure in lead pipes and traps. Figures 10, 11 and 12 seem to confirm this theory. These specimens are honey-combed, and the holes all occur above the water-line, showing that they were not caused by chemicals in the water alone.

Sewer-air is variable, as it depends upon discharges into the sewer, as well as upon the cleanliness of the sewer. This depends upon localities, manufactures, slaughter-houses, etc. The gases might and would vary from day to day in the same sewer. The constant elements in sewer-air are carbonic acid gas or carbonic dioxide, oxygen, nitrogen, carbonic oxide, and scarcely appreciable quantities of sulphuretted hydrogen. Carbonic dioxide is found in the atmosphere in the proportion of three to five volumes in ten thousand volumes of air. Sewer-air contains from ten to twenty-four volumes of carbonic dioxide in ten thousand volumes.

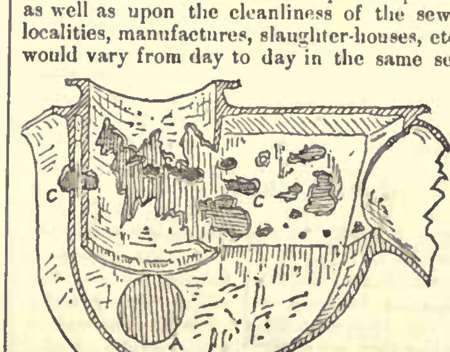
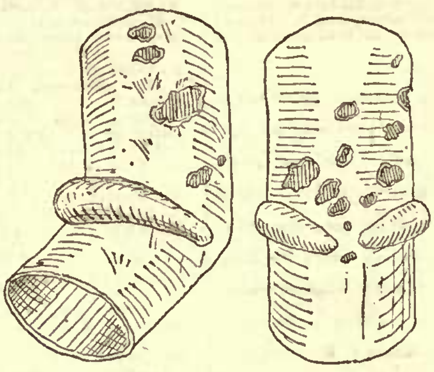


Fig. 10.—Trap corroded by Sewer-Air.
A. Waste-Pipe. C. Holes eaten through the Lead.

Now lead is easily corroded when it is brought in contact with air highly charged with carbonic acid gas. This is the case where sewer-air comes in contact with the lead trap. The lead absorbs oxygen, forms an oxide, which in turn combines with carbonic acid and water to produce the basic carbonate of lead or white lead. This fine white powder would be washed off by the discharge from the closet, thus leaving the surface of the lead to again go through the same chemical action, until a hole is eaten into the trap. The top of the trap has no holes in it, but a small deposit of the carbonate. The reason for this may be that it is not as easily washed as the side of the trap, and the

[1] Since the publication of the first part of this article I have received a letter from Mr. S. S. Hellyer, giving his experience in reference to deposits. He has been watching the matter for years. He considers sewage the principal cause. Traps improperly flushed have deposits, while those which are flushed have not. The deposit depends more on the quantity than the quality of the water. He finds that urinals and closets used for urinals are more liable to deposit than others.

first formation remains and protects the lead. Particles of this corrosive powder were tested by Dr. White and found to be carbonate of lead. This chemical action does not take place where the pipes and traps are thoroughly ventilated, as the carbonic dioxide is diffused through the air. This action of carbonic dioxide forms an excellent plea for the ventilation of lead traps whenever they are used. Figure 10 was taken from beneath a Bramah closet that had an excellent flush and was free from deposit. It was unventilated. The piece of soil-pipe illustrated was also unventilated (Figs. 11 and 12). There was a hard deposit in this pipe, ranging from one-sixteenth to a quarter of an inch in thickness, similar to Analysis No. 2.



Figs. 11 and 12.—Pipe corroded by Sewer-Air.



Fig. 13.—Trap-top corroded by Mortar or Slaked Lime.

Mortar or quicklime is liable to drop upon or come in contact with the lead used in pipes or traps at almost any moment in the construction of a building. Figure 13 shows a specimen in which the holes are evidently caused directly or indirectly by mortar resting on the top of it. The top is completely destroyed, as shown in the cut. The hydrate of lime or slaked lime absorbs, and thus concentrates, carbonic acid or dioxide freely from the air. In this way it is probable that the carbonic dioxide is brought in contact with the lead in a sufficient degree of concentration to make the carbonate of lead, and act upon it as in the case of sewer air. (There is a deposit in this trap similar to Analysis No. 1.)



Fig 14.—Scale, Figs. 15 to 17, 19 and 21 inclusive.

A piece of lead pipe removed from the Navy-Yard at Boston is completely destroyed by chemical action. The end is eaten off and the pipe riddled with holes (Fig. 15). This corrosion was attributed to the action of *cold water*; — it may be due to dilute nitric or carbonic acid. If carbonic acid gas caused the action, it may have been aided by cold water, in so far as cold water absorbs more gas than hot or warm water does. This pipe was submerged in water, and the corrosive action has taken place on the outside of the pipe.

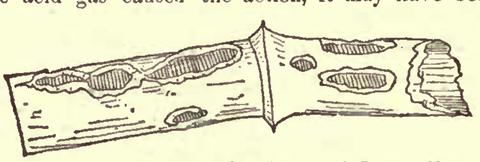


Fig. 15.—Lead Pipe taken from Navy-Yard, Boston, Mass.

The same contributor has presented the Museum with a piece of galvanized or zinc-coated iron pipe (Fig. 16), pitted as if it had had the small-pox. It came from the Boston Navy-Yard, and the pits are attributed to *cold water*, but are evidently caused by simple oxidation where the pipe is imperfectly coated with zinc. In two places the holes have been eaten entirely through the pipe.

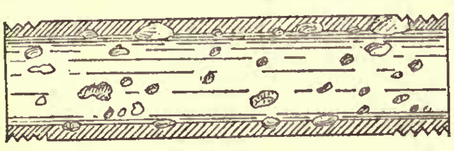


Fig. 16.—Oxidized Iron Pipe from Boston Navy-Yard.

Figure 17 shows a flattened piece of block-tin pipe used for ten years in conveying spring water from the Observatory at Cambridge, Mass., to a house on the corner of Garden and Madison Streets. It has been affected by some acid. Nitric acid acts upon tin in this way. Well and spring waters near large cities are liable to contain the salts of nitric and nitrous acids. It is at least probable that salts of this character were in the water conveyed by this pipe, and being decomposed, the nitric acid attacked the tin.

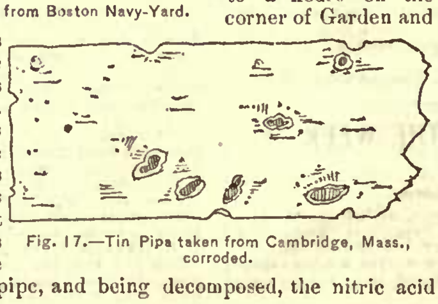


Fig. 17.—Tin Pipe taken from Cambridge, Mass., corroded.

ACTION OF VERMIN.

In Figure 6, which has already been illustrated, there is a hole cut by rats through both the solder and the lead. The teeth marks of these vermin are distinctly visible. This trap, as Mr. Hellyer informs us, had been in use in London for forty-five or fifty years, and was much corroded for want of ventilation. The pipe on the outlet has a soldered joint repaired by putty (the never-failing plumber's companion) and paint.

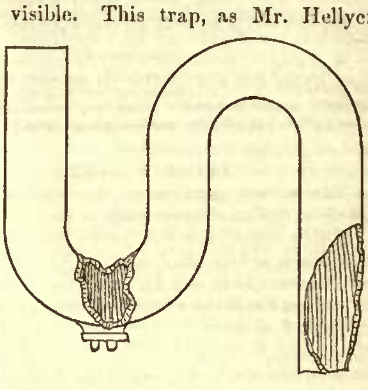


Fig. 18.—Lead Trap gnawed by Rats. (For Scale see Fig. 1.)

An excellent specimen of rats' work is shown in (Fig. 18) a one-and-one-half-inch S-trap of lead taken from the residence of Ex-Surgeon General S. P. Wales, Washington, D. C. The teeth marks of the rat are distinctly visible where he has gnawed a hole through the trap in two places. Either hole is large enough for the rat to have entered the trap through it.

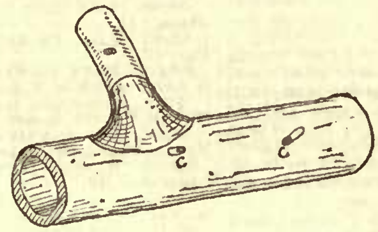


Fig. 19.

C. Holes bored by Ants. (For Scale see Fig. 14.)

Few people would think that an ant of any species could or would bore their way through a lead pipe. Such a specimen is shown in Figure 19, a piece of one-inch lead pipe brought from Lima, Peru. The holes were bored by a species of ant (Termes Terrebrosus). The ants were seen at work boring their way into the lead pipe by Dr. C. H. White, who furnished this specimen to the Museum. This is supposed to be the only recorded case of ants eating through lead.

MECHANICAL ACTION.

Figure 20 is a specimen illustrating the effects (as Mr. Hellyer says) "caused by expansion and contraction consequent upon the discharge of a hot-water waste from a scullery sink which was in connection with this piece of soil-pipe." As can be seen in the cut the pipe is cracked or ruptured in two places, one extending half-way around the pipe. The interior of this pipe is completely covered with an incrustation about a sixteenth of an inch thick. The lead is in a perfect state of preservation where this incrustation is broken away. This deposit is similar to Analysis No. 2.

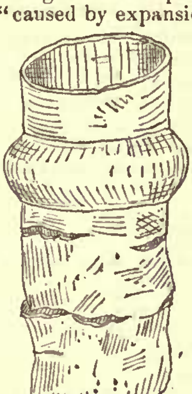


Fig. 20. — Pipe ruptured by Expansion and Contraction of Heat and Cold. (For Scale see Fig. 1.)

An elbow taken from beneath a bath-tub in Washington, D. C., illustrates both a "tinker's" joint and the effects of settlement on plumbing fixtures (Fig. 21). This gives a graphic idea how closets and other connections put so as to depend on the floor may have yawning openings in them without the knowledge of any one in the house. Plumbers or architects who find specimens in taking out old plumbing, illustrating either well-known or curious defects or causes of failure would do well to send them to the Museum of Hygiene, rather than let them be thrown aside and become destroyed. In the Museum they will be preserved and put on exhibition, where all who are interested in sanitation may examine and study them in connection with kindred examples.

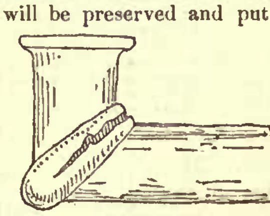


Fig. 21. —Waste - Pipe broken by settlement. (For Scale see Fig. 14.)

By studying fixtures which have actually been in service we may learn what shapes and metals to avoid under varied circumstances. The broader our knowledge with more freedom we can use our discretion. Different methods and arrangements will be found best under varied circumstances, and it is only by experience and educated judgment that the architect or engineer will be able to select or design the best system for each particular place.

Glenn Brown.

The champion mean man has turned up in the shape of a Bostonian. A South Boston man recently built two houses, side by side, one for himself and one to sell. In the house sold he had placed a furnace against the party-wall of the cellar, and from its hot-air chamber he had constructed flues to heat his own domicile. The owner of the other house found it very hard to keep his house warm, and was astounded at the amount of coal required to render his family comfortable, while the dishonest builder kept himself warm at his neighbor's expense nearly a whole winter before the trick was discovered.— *Sanitary News.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

TRADE SURVEYS.

THE salient features in the building-material markets during the past week have been, reduced business, firm prices, restricted productions in certain lines, and full production with higher prices in other lines. Building will probably be more active this winter than last. Various reasons have been assigned for this favorable conclusion, among which it may be mentioned are, the apprehension in the minds of many who contemplate building of a general advance in prices; the possibility of such an advance in real estate, in suburban districts especially, as would discourage building enterprises; the possibility of a relative scarcity of capital that might result from its partial diversion into expanding channels of trade and production, and finally, the possibility of a general hardening of prices, growing out of a number of causes, among which are, the gradual equalization of population, which is harmonizing production and consumption; the opening up of opportunities of capital and enterprise along the lines of railroads built within two or three years, and the establishment of better organized control over production, and by transporters over transportation. Altogether there are enough reasons to lead a good many men to do work this winter which they think they may need next spring. At the same time there is no reason for expecting more than a return of values to normal levels.

In New England, despite the overtalked-of meagreness of profits in textile, boot and shoe, machine-shop and other classes of work, the results have been such as to justify a material expansion of productive capacity, and more or less building is projected. Electrical and mechanical appliances of new design are called for with enough life to raise hopes of a stronger winter demand. These straws point to more shop and mill construction.

In the Middle States building activity has been very marked. The housing of persons of moderate means has occupied most of the average architects' time and attention, and more than usual work is in hand at this time for winter execution.

The iron and steel industries have received a moderate stimulus. Rail-mills are selling rails for spring delivery at $4.00 per ton more than last summer's prices. Bars, plates and sheets are in fair demand. Skelp-iron and wrought-iron pipe orders are weeks ahead of supply. Nails are extremely scarce, and a general advance of five to ten per cent is being accorded by employers, whose only anxiety is to get nails at any cost. Steel mill and tool work, lathe and drill and general machine shop work is in active request.

It does not appear that the supply of small houses has yet been overdone. Cautious architects have frequently intimated that the safe limit had been reached in many industrial communities, but investors evidently do not think so. The generally prosperous condition of the working classes, the spreading popularity of building and loan and other associations; the anxiety of holders of money to invest in house-building; the anxiety of owners of property to cover their property with brick and mortar, and the success which has attended the investments of the past two years, with an apparent demand for much more house room, all unite to confirm the opinions of conservative authorities on building matters, that the coming year will be one of no less activity than the present. In western Pennsylvania the activity in building has extended to the erection of manufacturing establishments, particularly for specialties, and to the construction of natural-gas pipe-lines. Much interest is exhibited by manufacturers at remote points in natural gas, and several removals of large works east and west are said to be contemplated.

In Cleveland, building activity has not abated much as yet. In Cincinnati the building trades have been fairly employed, but architects report less interest at present with reference to next year's work. In Chicago the activity in building, while extending in the direction of house-building, has been restricted largely to shop and mill capacity and machinery improvements. It can be said that the tendency has been in this, as well as some other western cities, to the manufacturing requirements of the community, rather than to homes. The finer rather than the commoner class of residences is occupying most attention. Building material of all kinds, unless lumber is excepted, is firm in price and active in demand. Some depression exists in many smaller Western towns, but work is not usually done far in advance of construction.

The supply of lumber of all kinds is large in all markets, both East and West, and prices for the better qualities will harden somewhat during the winter, because of the usual advance in freight rates, and also because this advance and the continuance of large shipments serves as an assurance to consumers that stocks will not fluctuate, and therefore tend to steadier or higher prices.

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

328,932. FIRE-SCREEN AND VENTILATOR. — Albert E. French, East Tawas, Mich.
328,934. HOISTING-DRUM FOR ELEVATORS.—Benjamin W. Grist, Reading, Pa.
328,953. FIRE-ESCAPE. — Dan'l J. MacLean, Reading, Pa.
328,967. BRUSH FOR CLEANING CHIMNEYS.—Anton Oelschleger, Boston, Mass.
328,980. WRENCH. — Albert W. Stossmeister, Newport, Ky.
328,999. SCAFFOLD-BRACKET.—J. Henry Ballman, Indianapolis, Ind.
329,000. DOOR SPRING AND CHECK.—Joseph Bardsley, Newark, N. J.
329,005. SASH-CORD GUIDE. — Henry L. Blodgett, Chicago, Ill.
329,006. SASH-PULLEY. — Henry L. Blodgett, Chicago, Ill.
329,012. METALLIC FLOOR AND SURFACE. — Frank R. Cargill and Wm. V. Kent, Chicago, Ill.
329,032. COMBINED DOOR SPRING AND CHECK. — William F. Falls, Boston, Mass.
329,034. SELF-ADJUSTING SEWER-SCRAPER. — Michael Fitzsimons, Lake, Ill.
329,069. HEATING-STOVE. — John B. Oldershaw, Baltimore, Md.
329,107. BURNER FOR HEATING PURPOSES.—Lewis H. Watson, Chicago, Ill.
329,115. APPARATUS FOR MOISTENING AND PURIFYING AIR.—Casimir Wurster, New York, N. Y.
329,129. ELEVATOR. — Valentin Borst, New York, N. Y.
329,130. KNOB-ATTACHMENT.— Jeffry E. Bowman, Norwich, Conn.
329,133. CUTTING - NIPPERS. — Peter Broadbooks, Batavia, N. Y.
329,147. SAFE-DEPOSIT VAULT.— Rufus E. Dixon, New York, N. Y.
329,148. CRANE AND DERRICK. — William S. Doan, Sacramento, Cal.
329,156. COMBINATION SQUARE AND GAUGE.—William Ford, Birmingham, Conn.
329,190. FIRE-ESCAPE. — Thos. D. McKinzie, Colorado, Tex.
329,219. TRAVELLING CRANE. — Edward Samuel, Philadelphia, Pa.
329,221. PIPE-WRENCH.—Franz A. Schramm, Philadelphia, Pa.
329,224. FIREPLACE. — Geo. E. Sharpe, Steubenville, O.
329,226. WEATHER-STRIP.—Jesse Shilling, Sr., and Jesse Shilling, Jr., Troy, O.
329,233-234. NON-FREEZING FORCE-PUMP. — Wm. M. Stevenson, Cleveland, O.
329,253. BURGLAR-ALARM. — Cyrus P. Bachelder, Pawtucket, R. I.
329,256. FIRE-ESCAPE. — Albert G. Bierbach, Milwaukee, Wis.
329,287. WINDOW - SCREEN. — William M. Dana, Ripon, Wis.
329,296. PNEUMATIC DOOR-CHECK.—Gilbert R. Elliott, Boston, Mass.
329,297. DOOR-SPRING.—Gilbert R. Elliott, Boston, Mass.
329,298. DOOR-CHECK. — Gilbert R. Elliott, Boston, Mass.
329,311. AUTOMATIC FIRE-EXTINGUISHER. — John Hill, Columbus, Ga.
329,317. SASH - PULLEY. — Thos. M. Kenna, New Haven, Conn.
329,321. COMBINED DOOR KNOB AND STOP. — John Leger and Ernest Keller, New York, N. Y.
329,333. SHUTTER-WORKER. — Patrick K. O'Lally, Boston, Mass.
329,353. ATTACHMENT TO SQUARES. — William S. Winterbottom, Philadelphia, Pa.
329,359. FIRE-ESCAPE. — John Brückner and John J. Brückner, Philadelphia, Pa.
329,360. AUTOMATIC FIRE-EXTINGUISHER.—James Buel, Woburn, Mass.
329,361. SUPPLY-TANK FOR WATER - CLOSETS. — Wm. Bunting, Jr., Boston, Mass.
329,388. TRAP FOR SOIL AND OTHER PIPES. — Samuel S. Hellyer, London, County of Middlesex, Eng.
329,389. STONE LIFTER AND CARRIER. — Riley J. Hosmer, Romeo, Mich.
329,392. DRAWING - BOARD. — Edmund Jordan, Brooklyn, N. Y.
329,404. COMBINED STREET - RECEIVER AND STENCH-TRAP. —David W. McConnell, Buffalo, N. Y.
329,406. PIPE - VISE. — Henry Meadows, Windsor, Ontario, Can.
329,409. SASH-BALANCE. —Wm. Ormsby, Boston, Mass.

SUMMARY OF THE WEEK.

Baltimore.

CHAPEL. — W. Claude Frederic, architect, has prepared plans for a German Evangelical chapel, 35′ x 75′, to be erected cor. Battery Ave. and Randall St., of brick and stone, Queen Anne style; seating capacity three hundred; cost, $6,000; Geo. A. Foreman, builder.

COTTAGE. — Jas. L. Ames is to have erected a frame cottage, on N Ave., extended, cor. Sixth St., on lot 100′ x 300′; cost, $3,500; W. Claude Frederic, architect.

WAREHOUSE.—The Warfield Manufacturing Co. is to have erected a three-st'y brick and terra-cotta building, 50′ x 69′, on North St., nr. Pleasant, from designs by J. Buckler Ghequier, architect; Philip Walsh & Sons, builders.

HOUSE.—W. Claude Frederic, architect, has prepared plans for a dwelling for himself, to be erected on North Ave., e of Eutaw Pl., on lot 15′ x 95′, to be of brick and brown-stone, with bay-window front; Jacob Sauru & Co., builders.

BUILDING PERMITS. — Since our last report sixteen permits have been granted, the more important of which are the following: —

H. Guttermuller, three-st'y brick building, e s Stemmer's Alley, between Pratt and Stiles Sts.

Herman Born, three-st'y brick building, 25′ x 35′, e s Saratoga St., e of Fremont St.

Thos. Leimback, three-st'y brick building, w s Eutaw St., n of Hamburg St.

Henry Smith, 7 three-st'y and mansard brick buildings, w s Park Ave., n w cor. Mosher St.

A. L. Gorter, 5 three-st'y stone-front buildings, n s Preston St., n e cor. Charles St.

J. L. Shaw & Sons, 10 two-st'y brick buildings, s w cor. Luzerne and Oliver Sts.

Chas. Herbert, 2 three-st'y brick buildings, e s Bond St., n e cor. Lanvale St.

Boston.

BUILDING PERMITS— *Circuit St.*, No. 22, stable, 22′ x 24′; owner, O. J. Moore; builder, E. F. Brown.

Atlantic Ave., near Ashland St., dwell., 20′ x 24′; owner, J. W. Darton; builder, Charles Valey.

Sagamore St., near Ramsey St., dwell., 30′ 8″ x 39′; owner, W. H. Besarick; builder, William Lent.

Cushing Ave., near Sawyer Ave., dwell., 26′ 6″ x 30′ 4″; owner, A. K. Kent; builder, Chas. E. Currier.

Pine St., near Brook St., dwell., 20′ x 27′; owner, Joseph Pinfield; builder, R. W. Stevens.

Reading St., near Island St., storage, 23′ x 43′; owners, Curtis & Pope; builder, William Tobin.

Saratoga St., No. 655, dwell., 19′ 6″ x 30′; owner, John Riley; builder, J. G. Martin.

Nixon Ave., near Mather St., dwell., 21′ x 53′; owner, Geo. O. Boynton; builder, John Hass.

Ray St., Nos. 10-12, dwell., 20′ x 50′; owner, J. J. Driscoll; builders, Maddeno & O'Brien.

Brooklyn.

BUILDING PERMITS.—*Bergen St.*, e s, 325′ w Rockaway Ave., 2 two-st'y frame dwells., tin roofs; cost, each, $1,500; owner, Patrick Carney, 209 York St.; architect, O. L. D. Spulthoff; builders, O. S. Totten and Frank Bollinger.

Sixteenth St., Nos. 367 and 369, n s, 272′ 10″ e Seventh Ave., 2 three-st'y frame tenements, tin roofs; cost, $2,800; owner and builder, Jas. Durney, 295 Sixteenth St.; architect, G. Morgan.

Second St., No. 134, 200′ e Third Ave., three-st'y frame dwell. and factory, tin roof; cost, $2,900; owner; F. Shoeneberger, 129 Eighteenth St.; builder, J. Staehler.

Flatbush Ave., e s, 25′ n Sterling Pl., three-st'y brown-stone store and dwell., tin roof; cost, $6.000; owner, John Konvalinka, 206 Park Pl.; architect, W. M. Cook; builder, J. V. Porter.

Sterling Pl., n s, 22′ 7″ e Flatbush Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, $9,000; owner, architect and builder, same as last.

Flatbush Ave., n e cor. Sterling Pl., four-st'y brown-stone dwell., tin and slate mansard roof; cost, $10,000; owner, John Konvalinka, 206 Park Pl.; architect, W. M. Cook; builder J. V. Porter.

Baltic St., s s, 149′ 6″ n Hicks St., 2 four-st'y brick tenements, metal and composition roof; cost, $8,000; owner, J. W. Dearing, 450 Henry St.; architects, Parfitt Bros.

Wallabout St., n s, 184′ e Wythe Ave., rear, two-st'y brick building, gravel roof; cost, $3,500; owner, D. H. Brown, 143 Bedford Ave.

Palmetto St., Nos. 109 and 111, 225′ s w Irving Ave., 3 two-st'y frame (brick-filled) dwells., tin roofs; cost, $6,000; owner, architect and builder, J. Hertlin, 149 McDougal St.

Howard Ave., s w cor. Madison St., three-st'y brick store and dwell., tin roof; cost, $7,000; owner, D. Radermacher, on premises; builders, E. Zitterlein and J. Pirrung.

Third Ave., s e cor. Thirty-fifth St., three-st'y frame store and dwell., tin roof; cost, $3,500; owner, May Wise, Thirty-fourth St. and Third Ave.; builder, J. H. O'Rourke; architect, S. B. Bogert.

Wallabout St., n s, 220′ e Wythe Ave., 2 three-st'y brick dwells., gravel roofs; total cost, $5,000; owner, D. H. Brown, 143 Bedford Ave.

Noble St., s s, about 150′ w Lorimer St., 2 three-st'y brick dwells., gravel roofs; cost, $4,000; owners, architects and contractors, Randall & Miller, 493 Fourth St.; mason, not selected.

Sumpter St., n s, 150′ e Howard Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,100; owner, W. Schmidt, 155 Marion St.; builders, J. Pirrung and C. Horn.

Prospect Ave., s s, 225′ e Seventh Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $5,000; owner, H. B. Lyons, Hawthorne St., Flatbush; architect, W. M. Coots; builders, Johensen Bros. and H. B. Lyons.

Ivy St., s s, 250′ w Evergreen Ave., 2 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,800; owner, Mary E. England, 1218 Broadway; architect and contractor, O. H. Doolittle; mason, L. V. Hyers.

Schermerhorn St., No. 227, 327′ 2″ e Hoyt St., three-st'y brick dwell., tin roof; owner, John Sterling, 225 Schermerhorn St.; contractor, M. J. Morrill; builders, J. O'Rourke and Morris & Selover.

Gates Ave., n s, 125′ e Sumner Ave., 3 four-st'y brown-stone stores and dwells., tin roofs; cost, each, $8,000; owners, architects and builders, W. M. & E. H. Hawkins, 554 Quincy St.

Elm St., Nos. 155 and 157, n s, 125′ 4″ w Central Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, $9,000; owner and builder, Geo. Straub, 11 Lewis Ave.; architect, Th. Engelhardt.

Park Ave., Nos. 627-633, s s, 225′ w Marcy Ave., 4 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, $18,000; owner and mason, George Straub, 11 Lewis Ave.; architect, Th. Engelhardt.

ALTERATIONS.—*Waverly Ave.*, No. 433, two-st'y and cellar brick extension, tin roof; cost, $4,500; owner,

John W. Hollenback; architect, M. Thomas; builders, C. Cameron and H. J. Smith.

Wythe Ave., No. 199, cor. Hewes St., one-st'y brick extension, tin roof, also Hewes-street wall supported on iron girders, etc.; cost, $2,500; owner, J. N. Puckhaber, Wythe Ave., cor. Hewes St.; architect, T. Engelhardt; builders, Leahey & Moran and C. Schneider.

Hewes St., No. 55, add two stories, also three-st'y extension, altered to store and flats; cost, $4,000; owner, architect and builder, same as last.

Chicago.

BUILDING PERMITS.—J. A. Swasey, three-st'y dwell., 3017 Michigan Boulevard; cost, $6,000.

C. F. Remick, three-st'y dwell., 1918 Clark St.; cost, $8,000.

H. Philippi, 3 two-st'y dwells., 3548-3552 Ellis Ave.; cost, $20,000.

J. W. Rush, three-st'y dwell., 26-28 Delaware St.; cost, $12,000; architects, Addison & Fiedler.

City of Chicago, two-st'y engine-house, 243 Coulter St.; cost, $10,000.

P. M. Almini, 2 two-st'y dwells., 415-415½ Lasalle Ave.; cost, $10,000; architects, Cobb & Frost.

C. Werner, two-st'y store and flats, 1264-1266 Cottage Grove Ave.; cost, $12,000.

M. O. Williams, three-st'y shop and dwell., 488 Wells St.; cost, $3,300.

H. L. Schmidt, three-st'y dwell., 254 North Carpenter St.; cost, $5,600; architect, C. O. Hansen.

Klotz & Meister, 2 four-st'y stores and flats, Milwaukee Ave.; cost, $12,000.

M. Dold, two-st'y dwell., 627 Ashland Ave.; cost, $2,800; architect, W. Thomas.

A. Bessler, three-st'y dwell., 816 West Twelfth St.; cost, $4,000.

H. Miller, two-st'y dwell., 694 Twenty-first St.; cost, $3,000.

V. Fiala, two-st'y dwell., 817 Ashland Ave.; cost, $3,400.

H. B. Peabody, 2 three-st'y stores and flats, 491-493 State St.; cost, $28,000; architect, J. J. Flanders.

Presbyterian Theological Seminary, 5 two-st'y dwells., 509-519 Fullerton Ave.; cost, $16,000; architect, A. M. F. Coulton.

H. Loescher, two-st'y dwell., 245 Sheffield St.; cost, $3,500; architect, E. Riegert.

W. H. Lyford, two-st'y dwell., 2919-2921 Groveland Park Ave.; cost, $9,000; architect, L. M. Beers.

H. Schaller, 2 two-st'y dwells., 48 Vedder St.; cost, $4,000; architect, H. Schaller.

D. H. McDonald, one-st'y addition, 50-52 Dearborn St.; cost, $2,500.

E. N. Blake, five-st'y bakery, 196-198 Clark St.; cost, $15,000; architects, J. M. Van Osdell & Co.; builders, Fox & Hines.

E. N. Blake, four-st'y addition, 196-198 Clark St.; cost, $5,000; architects, J. M. Van Osdell & Co.; builders, Fox & Hines.

R. Bines, seven-st'y factory, 727-729 Dearborn St.; cost, $30,000; architects, J. M. Van Osdell & Co.; builders, C. & A. Price.

A. T. Ewing, 9 three-st'y stores and dwells., 3701-3713 Cottage Grove Ave.; cost, $35,000.

Marshall Field, seven-st'y store, cor. Quincy and Franklin Sts.; cost, $500,000; architect, H. H. Richardson; builders, Norcross Bros.

W. H. Thomas & Son, 5 three-st'y dwells., 777-781 West Lake St.; cost, $28,000.

J. Wilson, three-st'y store and flats, 398 Ogden Ave.; cost, $6,000.

J. A. Landon, 6 two-st'y dwells., 944-955 West Jackson St.; cost, $24,000; architect, J. Austin.

F. H. Blackman, two-st'y dwell., 78 Morgan St.; cost, $6,000.

W. J. Anderson, 6 two-st'y dwells., 1316-1328 West Adams St.; cost, $15,000.

J. B. Clow, six-st'y warehouse, cor. Lake and Franklin Sts.; cost, $50,000.

Louisa Tiemann, two-st'y dwell.; 63 Thirteenth Pl.; cost, $3,000.

W. W. Kimball, five-st'y factory, Kinzie St.; cost, $20,000.

P. Landers, three-st'y store and dwell., 639 West Indiana St.; cost, $7,000.

J. Benson, two-st'y addition, 200 Curtis St.; cost, $2,500; architect, L. Lutken.

A. Pearson, two-st'y flats, 1111 Harrison St.; cost, $6,000.

P. Schoenhafer, two-st'y barn, Prairie Ave.; cost, $3,400; architect, H. Cudell.

F. Burman, two-st'y dwell., 3216 Vernon Ave.; cost, $6,500.

P. Taylor, two-st'y flats, 179 Peoria St.; cost, $4,500.

C. Cook, 3 two-st'y dwells., 3728-3732 West Lake St.; cost, $15,000.

Minneapolis, Minn.

BUILDING PERMITS. — Alfred J. Veness, two-st'y wood dwell., n e cor. West Twenty-sixth St. and St. Aldrich Ave., n; cost, $4,300.

Laura T. Vergurson, two-st'y wood dwell., n e s North Aldrich Ave., bet. Twenty-sixth and Twenty-seventh Aves., n; cost, $3,000.

W. Lyons, two-st'y wood dwell., w s North Irving Ave., bet. Fourth St. and Fifth Ave., n; cost, $3,500.

Frank Callom, brick hotel building, s cor. Second St. and First Ave., s; cost, $18,000.

Northwestern Panorama Building Co., brick panorama building, w s Fifth St. and First Ave., s; cost, $25,000.

New York.

DEPOT.—Plans for the New York Central Railroad's new depot have been drawn by Messrs. R. H. Robertson and A. J. Manning. The building is to be built at the n w cor. cor. of Park Ave. and One Hundred and Thirty-eighth St.; will be two and a half stories high, 105′ x 185′, and will cost about $60,000.

CLUB-HOUSES. — The Manhattan Athletic Club will have a building designed to occupy the four lots they have bought from Judge Hilton, on the s e cor. of Park Ave. and Fifty-ninth St.

The Arion Society will erect a handsome club-house, with large singing-hall, etc., the building to cover a lot 100′ x 125′, and to cost probably $180,000.

HOTEL. — The "Colonnade" will be enlarged by the addition of rooms to be built over the stores, to occupy the site of Messrs. Harrigan & Hart's Theatre.

HOUSE.—Mrs. Mary Herter proposes to build a house to occupy a site, 75′ x 100′, on the s e cor. of Madison Ave. and Seventieth St.

BUILDING PERMITS. — *East Sixty-sixth St.*, s s, 180′ e Fourth Ave., two-st'y brick stable, flat gravel and cement roof; cost, $11,525; owner, Chas. F. Clark, 279 Broadway; architects, Chas. Buek & Co., 500 Madison Ave.

Sixty-ninth St., n s, 74′ e Second Ave., five-st'y tenement, brick and brown-stone front; cost, $18,000; owners, Higgins & Keating, 301½ East Seventy-ninth St.; architects, A. B. Ogden & Son, 409 East Fifty-third St.

Seventieth St., s s, 74′ e Second Ave., five-st'y tenement, flat tin roof; cost, $16,000; owners and architects, same as last.

Ogden Ave., w s, 70′ n Devoe St., two-st'y frame dwell., slate and tin peak roof; cost, $3,500; owner, Henry B. Stilson, 339 Second Ave.; architect, Henry Fouchaux, Tenth Ave. and One Hundred and Fifty-eighth St.

Washington St., Nos. 415 *to* 419, seven-st'y brick warehouse, flat tin roof; cost, $35,000; owner, James Pyle, 215 West Forty-fifth St.; architect, Thomas R. Jackson, 61 Broadway.

Ninth Ave., s w cor. One Hundred and Seventh St., 7 five-st'y tenements, flat tin roofs; cost, $100,000; owner, Henry Bornkamp, 306 West One Hundred and Twenty-seventh St.; architect, R. Rosenstock, 335 Broadway.

Mulberry St., Nos. 244 *and* 246, five-st'y brick tenement, flat metal roof; cost, $10,000; owner, Mrs. Anna C. Keane, 113 East Thirty-fifth St.; architect, John B. Snook, 12 Chamber St.

Lexington Ave., w s, 71′ s One Hundred and Twenty-fourth St., five-st'y brick tenement, brick and brown-stone front, flat tin roof; cost, $25,000; owners, White & Anderson, 44 East One Hundred and Thirty-third St.; architect, G. Robinson, Jr., 149 East One Hundred and Twenty-fifth St.

One Hundred and Twenty-first St., s s, 400′ w Sixth Ave., 5 three-st'y and basement brick dwells., brown-stone fronts, flat tin roofs; cost, $75,000; owners and architect, same as last.

Second Ave., e s, from Sixty-ninth to Seventieth Sts., 8 five-st'y brick tenements, flat tin roofs; cost, $120,000; owners, Higgins & Keating, 301½ East Fifty-third St.; architects, A. B. Ogden & Son.

Sixth Ave., w s, 25′ s One Hundred and Thirty-sixth St., 3 three-st'y brick dwells., flat tin roof; cost, $30,000; owner, Frederick Oldhous, 233 West One Hundred and Twenty-third St.; architect, John C. Burne, 1531 Third Ave.

Philadelphia.

BUILDING PERMITS. — *Carlisle St.*, n Columbia Ave., two-st'y stable; R. J. Dobbins, owner.

Broad St., n Coulter St., 2 two-st'y dwells.; Jno. Bodling, contractor.

Cumberland St., s Mill St., two-st'y packing-house; Thos. W. Wright & Son, contractor.

Chew St., near Mill St., two-st'y stable; Thos. W. Wright & Son, contractor.

Nineteenth St., No. 1835, two-st'y stable; William Smith, contractor.

Highland Ave., e Twenty-seventh St., two-st'y stone stable; Wm. C. Mackie, contractor.

Hartwell Ave., near Thirty-seventh St., three-st'y dwell.; Wm. C. Mackie, contractor.

Isabella St., e Coral St., 2 three-st'y dry-houses; Dickson Bros., contractors.

Frankford Ave., s Arrott St., three-st'y dwell.; Jos. B. Gerkes, owner.

Third St., No. 495, in rear, three-st'y stable; Jno. Klebe, contractor.

Sixth St., s Catharine St., two-st'y store; Charles McCaul, contractor.

Cambridge St., w Twentieth St., 4 two-st'y dwells.; Robt. McClellan, owner.

Amber St., near Cumberland St., 2 two-st'y stores; Jas. Kitchenan, owner.

Morris St., n Queen St., two-st'y dwell.; Fred. Eldredge, owner.

Almond St., n Clearfield St., 5 two-st'y dwells.; J. R. Pyle, owner.

Sixteenth St., n York St., 10 three-st'y dwells.; Thos. Twibill, owner.

Thomas Ave., n York St., 7 two-st'y dwells., Thos. Twibill, owner.

Christian St., w Twelfth St., 2 three-st'y stores; Thos. Grinnan.

Richfield St., w Twelfth St., 9 two-st'y dwells.; H. A. Miller, owner.

Manton St., w Twenty-first St., 19 two-st'y dwells.; Jno. McConagly, owner.

York St., s w cor. Jasper St., five-st'y factory, 39′ x 35′; Wm. Steale, contractor.

Broad St., n Cumberland St., two-st'y store; Jos. N. Pattison, contractor.

Baltimore Ave., w Forty-third St., stone chapel, 23′ x 58′; E. Thompson, contractor.

Waterloo St., n Norris St., 5 two-st'y dwells.; Wm. Tecklenburg, contractor.

Chester Ave., n Forty-eighth St., 2 three-st'y dwells.; Jas. D. Arthurs, contractor.

William Ave., e Jasper St., 9 two-st'y dwells.; J. R. Pyle, owner.

Fifteenth St., s Dauphin St., 3 two-st'y dwells.; G. K. Glifer, contractor.

Lawrence St., n Somerset St., 8 two-st'y dwells.; Jno. Mitchell, owner.

Aspen St., cor. Holly St., two-st'y dwell.; Fred. Michaelson, owner.

Columbia Ave., No. 1204, two-st'y dwell.; Conrad Bachle, contractor.

St. Louis.

BUILDING PERMITS. — Forty-nine permits have been issued since our last report, fourteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—

Henry B. Berger, two-st'y brick dwell.; cost, $6,800; F. J. Capitain, architect; W. J. Haegel, contractor.

German Methodist Episcopal Church, two-st'y frame church; cost, $3,500.

W. L. Balson & A. M. Everist, 3 two-st'y brick dwells.; cost, each, $2,800; W. L. Balson, contractor.

T. L. Davis, two-st'y brick dwell.; cost, $3,300; Stevenson, contractor.

John Rohan, three-st'y brick store and dwell.; cost, $4,500; Duffy, contractor.

Kluegil & Pappits, two-st'y brick furniture factory; cost, $5,500; Hartman & Davis, contractors.

Mrs. H. Subit, two-st'y brick dwell.; cost, $6,900; J. B. Legg, architect; W. J. Haegel, contractor.

O. Wagemann, 4 adjacent two-st'y brick tenements; cost, $4,200; F. J. Capitain, architect; W. J. Haegel, contractor.

Siegmond Stampfer, two-st'y brick dwell.; cost, $5,000; Aug. Beinke, architect; Chas. Rieve.

Fred. Knepper, two-st'y brick dwell.; cost, $6,000; Schildman & Gross, contractors.

Hyde Park Brewery Co., two-st'y brick engine and refrigerator house; cost, $3,500; sub-let.

C. W. Mitchell, two-st'y brick dwell.; cost, $4,500; Aug. Beinke, architect; Hemminghousen & Nollen, contractors.

F. W. Oliver, two-st'y brick dwell.; cost, $5,000; Ramsey & Swasey, architects; sub-let.

Mrs. L. V. S. Ames, 8 adjacent one-st'y brick stores; cost, $9,000; E. Jungenfeld & Co., architects; B. Weber & Co., contractors.

I. N. Miller, 2 adjacent two-st'y brick dwells.; cost, $5,000; Jas. J. Wharton, contractor.

I. N. Miller, 2 adjacent two-st'y brick dwells.; cost, $5,000; Jas. J. Wharton, contractor.

H. S. Randolph, two-st'y brick dwell.; cost, $2,800; J. B. Legg, architect; F. Kohlmeyer & Son, contractors.

St. Louis Mutual House Building Co., No. 3, two-st'y brick dwell.; cost, $3,100; E. Helmer & Bro., contractors.

St. Paul, Minn.

BUILDING PERMITS. — One-and-a-half-st'y frame dwell., n s Fifth St., bet. Bates and Maria Sts.; cost, $2,400; owner, Edward O'Conner.

One additional brick st'y, w s Jackson St., bet. Fifth and Sixth Sts.; cost, $2,000; owners, De Coster and Clark.

Two-st'y brick veneer dwell., w s St. Peter St., bet. Tilton and Martin St.; cost, $3,500; owner, Fergus Fahey.

Two-st'y brick veneer dwell., w s St. Peter St., bet. Martin and Aurora Sts.; cost, $3,500; owner, Fergus Fahey.

Two-st'y frame double store and dwell., e s Forest St., bet. Wallace and Tremont Sts.; cost, $2,700; owner, Richard McCarrick.

Two-st'y frame dwell., s s Portland Ave., bet. Kent and Dale Sts.; cost, $5,000; owner, E. F. Lambert.

Two-st'y frame dwell., s s Hennepin Ave., bet. St. Albans and Grotto Sts.; cost, $2,500; owner, Mrs. Mary Preston.

General Notes.

BRIDGEPORT, CONN.—State Armory; cost, $40,000; Robert W. Hill, architect, Waterbury, Conn.

CASSVILLE, WIS. — Work on the Chicago, Burlington & Northern Railway is progressing well. It is not improbable that Cassville will be selected as the location for the division headquarters of the new road, and that a roundhouse and repair-shops may be built at that place. Cassville is about midway between La Crosse and Savanna.

GLOUCESTER, MASS. — The city has voted $45,000 for a high school house.

KALAMAZOO, MICH.—Two-st'y frame house, 35′ x 50′, for C. D. Nelson; cost, $5,000; Palliser, Palliser & Co., architects, New York.

LAKE VIEW, ILL.—The corner-stone of the new high school building was laid September 19. The building will be a two-st'y brick, 88′ x 115′. There will be five recitation-rooms on the first floor; on the second an assembly-room, a museum, a laboratory, and a recitation-room for the teacher of sciences. The structure will be completed about May 1.

LITCHFIELD, MINN. — The Farmers' Alliance, of Meeker County, has decided to build a flat warehouse, capable of holding about ten thousand bushels of wheat. If it proves successful, other elevators will be built at other stations in the country.

MANCHESTER, N. H.—The Secretary of the Treasury has approved the selection of the Hanover-street property as the site of the new United States court-house and post-office.

MINKATO, MINN. — C. H. Austin & Son will build next spring a three-st'y brick building, 100′ deep, next to their present building, and will add one st'y to the one they now occupy.

MONTGOMERY, ALA. — The Alabama Soldiers' Monument Association has been organized here to build a monument to the Confederate dead on the Capitol grounds, where Jefferson Davis was inaugurated President of the Confederacy. The association includes most of the prominent men in Alabama. The monument is to cost $50,000, and Montgomery has already subscribed a large amount.

NEWARK, N. J. — A. Morris Stuckert, architect, has now under course of erection: —

A cottage on Roseville Ave., first st'y brick, for Austin Kimball, of New York; cost, $6,798.

House, for E. T. Hart, cor. High St. and Clinton Ave.; first st'y stone, upper part frame; cost, about $25,000.

Frame cottage, Clinton Ave., for S. S. Day; cost, $2,781.

Two three-st'y brick houses on Grant St., for M. E. Ticknor and J. P. Ross; cost, $7,700.

NEW BRITAIN, CONN.—House for J. B. Talcott, brick and stone; cost, $30,000.

Two houses for Stanley Bros., brick and stone; cost, $10,000 each.

Factory for P. & F. Corbin, five-st'y; cost, $30,000; Robert W. Hill, Waterbury, Conn., architect for the above.

OWATONNA, MINN.—A telegram has been received from Mr. G. Pillsbury, of Minneapolis, agreeing to build a ladies' boarding-hall, for use of the Minnesota Academy, if the Board would secure an endowment of $25,000.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. No. 516.

NOVEMBER 14, 1885.

Entered at the Post-Office at Boston as second-class matter.

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A FEW weeks ago we had occasion to say something about the hand-grenades now so extensively sold for extinguishing fires. In the public imagination, as it seems to us, these implements are endowed with virtues which they do not actually possess, and the lack of accurate knowledge concerning them exposes the whole community to a certain danger that the well-known means of extinguishing small fires, such as woolen cloths and pails of water, may be neglected, and precious time wasted, in order to try the virtues of the mysterious bottles upon incipient conflagrations. As it happened, our note excited the indignation of the agent for one of the hand-grenade manufacturers, who wrote a letter, expressing his sentiments, to the New York *Evening Post*, in which he was honest enough to give at length the formula for the composition with which his grenades are filled. Although the reading of this letter did not change our own opinion of the grenades, it explained in some degree the delusion under which the manufacturers, as well as some experts whom they have consulted, appear to have labored. In substance, the fire-extinguishing liquid of this company is, according to the formula, composed of a solution in water of common salt, carbonate of ammonia, carbonate of potash, muriatic acid, and bi-carbonate of soda in sufficient quantity to neutralize the acid. Both the experts and the manufacturers seem to have thought that the addition of so many carbonates and bi-carbonates to the liquid, in the presence of a stronger acid, would enable it to liberate carbonic acid when thrown upon a fire, and supplement the extinguishing power of the liquid by that of the gas, as is the case, to a small extent when the well-known chemical engines are used; and none of them seem to have reflected that such a mixture, confined in a thin glass bottle by a cork, would soon lose the carbonic acid set free on first mixing the ingredients, and would reduce itself to simple chlorides of sodium, potassium and ammonium; in other words, to a solution of common crude salt, with a little sal-ammoniac added. Of course, the brine has fire-extinguishing properties, surpassing to some extent those of water alone, since the salt left behind on the evaporation of the water by heat crystallizes over the combustible objects on which the brine is thrown, forming a fire-resisting coating; but beyond this the solution has, so far as we can understand, no efficacy whatever, and even in this property it would probably be surpassed by a solution of alum.

WE do not, however, wish to oppose our opinions to those of the hand-grenade companies and their distinguished experts, and are glad to be able to fortify our argument by the authority of Professor Kedzie, of the Michigan State Agricultural College, under whose direction a grenade, of one of the most popular sorts, was analyzed and tested. The liquid in this grenade was analyzed, and found to contain common salt in considerable quantity, with a little sulphate of lime and acetate of soda. On opening the grenades under water a small quantity of carbonic acid gas, amounting to about one cubic inch to each grenade, was collected; and by boiling the liquid a small additional amount was obtained. On throwing the grenades into a bonfire, no effect could be perceived, but an agent of the manufacturers happened to be in the neighborhood, and he kindly arranged a test for the experimenters, by constructing a vertical platform of pine boards, measuring six feet by eight, and coating it with kerosene oil and pitch. Setting fire to this, he was able, after the flames had gained some headway, almost to extinguish the fire by throwing in rapid succession at the platform six grenades. The experimenters having satisfied themselves that the grenades contained practically nothing but salt and water, made a series of trials, both with the commercial grenades and others, filled with solutions of salt, sulphate of soda, hyposulphite of soda, borax, bi-carbonate of soda and clear water. Several of these were as effective in extinguishing the burning oil and pitch as the salt solution, though none were more so; and all these were much more effective than water alone. To try whether carbonic acid could be kept in bottles in sufficient quantity to be of any use in extinguishing fires, several grenades were charged with brine and carbonic acid generated from limestone dust and sulphuric acid; but no increase in extinguishing power was observed, and the gas all escaped through the cork of the bottles in less than four days. A week or two before the Michigan experiments, as it happens, another test of a hand-grenade, of a different, but also well-known make, was carried out in Berlin by the Fire Department, which is there a branch of the police system. As we learn from the *Schweitzerische Bauzeitung*, of October 10, the Berlin authorities arrived at the conclusion that the liquid in the grenades possessed no more efficacy in extinguishing fires than two or three times the quantity of pure water. Of course, it is better to have salt and water at hand in case of fire than nothing, and the decorative appearance of a row of handsome blue or green bottles seems to prove an inducement to use them, if we may judge from the assertion of our critic in the *Evening Post*, who says that eight hundred fires have already been extinguished by his grenades; so that we may honestly say that we should be sorry to put any obstacles in the way of selling them under their true character.

ARCHITECTS are now so frequently called upon to provide, in their house plans, some suitable place for growing or keeping flowers in winter, that a little knowledge of the ways of doing so in the best and least expensive way is often of considerable service. It may be taken for granted that they usually know more about the subject than their clients, but the combined wisdom of all concerned is apt to lead to nothing better than a plan for an alcove, facing south or east, and either not heated at all, so that the tender plants freeze in cold nights, or furnished with a register, which distributes death and deformity with liberal hand among all but the most robust inmates of the place. Whenever the cost can be afforded, a separate room, with independent ventilation, warmed by hot water or steam, is far more satisfactory for growing house-plants than any accommodation which can be provided in the apartments occupied by their owners; but the expense of even the smallest conservatory carries it beyond the reach of most householders. Within a month or so, however, we have found in *La Semaine des Constructeurs* a description of a small greenhouse, which was shown at the Horticultural Exhibition this summer, and by its effectiveness and economy seems particularly well adapted for use as an addition to dwelling houses.

THIS greenhouse, which was designed by M. Le Tellier, may be described as a modified lean-to, the glazed roof having a double pitch, like half of an old-fashioned gambrel roof, and springing directly from a brick dwarf-wall, about two-and-one-half feet high above the greenhouse floor. The same dwarf-wall is continued across the ends of the structure, and the vertical sides above, to the roof line, are of glass. The typical structure is six-and-one-half feet wide, and ten feet long, and is wholly composed, above the dwarf-wall, of light metallic sash-bars, stiffened with gussets in the angles, and set about fifteen inches apart, so that the glass can be slipped in readily. In the length of ten feet are four ventilating lights, two in the lower slope of the glass roof, and two in the corresponding portions of the upper slope. These are hinged at the top, and are set open at any angle by the common "saw-tooth" lifting rods. Along the front wall, just at the foot of the glass roof, extends a "bench" or trough for earth, of galvanized-iron; and under this run the pipes of a "thermo-siphon," or hot-water heating apparatus, of a simple construction. In the angle of the roof,

over the bench, run two "strawberry shelves," hung from the rafters, where small plants can be set close to the glass, and a stage, with seven shelves, occupies the portion of the house next the back wall, a passage-way, with a door at the end of it, intervening between the stage and the bench. Considering its size, the capacity of this little greenhouse is enormous. The designer reckons it at four hundred and ninety-five small pots, but many plants would be stored, while resting or out of bloom, under the stage; so that the amateur who did not care for large specimens could probably get six or seven hundred plants of various sizes into it, all of them under favorable conditions, as almost any climate could be obtained in it, from the "bottom heat" of the galvanized-iron bench, for propagating or forcing, to the airy situation at the top of the stage, under the ventilators; and from the sunshine of the "strawberry shelves" to the shady positions under the stage. Including the thermo-siphon, which consists of a simple boiler, fed and managed from the outside, and a single loop of pipe, the entire cost of this building, glazed and set up in working order, is seventy-nine dollars. The whole is put together with bolts and screws, and if the proprietor wishes to increase the size, additional bays, each five feet long, and containing a pair of ventilators, are easily attached, and the shelves and the pipes of the thermo-siphon correspondingly lengthened, at a total cost of twenty dollars for each extra five-foot length. Although this seems to us astonishingly cheap, there is no reason why the same work, with our habits of working to guage, should not be done here for about the same price; and a small practicable greenhouse of this kind would be a welcome addition to hundreds of houses here, both in city and country.

ANOTHER model greenhouse somewhere on the other side of the water has a boiler which is regulated automatically in a simple way. Instead of supplying air for combustion through the lower door of the furnace, a separate opening is made under the grate, into which is fitted a piece of ordinary stove-pipe, with an elbow. The outer opening of this pipe has a very simple valve, in the form of a cover, which moves up and down, and is guided by wires, and has a wire attached to the middle, to serve as a handle for lifting, on which a thread is cut. This wire is passed through the end of a lever, and a nut, running on the screw-thread, serves for adjustment. Near the other end of the lever is attached a wire, which runs into the smoke-pipe of the furnace. If the fire burns up too strongly, the smoke-pipe gets heated, the wire lengthens, and the cover drops, shutting off a part of the supply of air to the fire, and reducing the combustion. If it goes down too far, the wire contracts, lifting the valve, and admitting more air to the fire, until the desired rate of combustion is reached. An obvious improvement on this would be, we think, to control the valve by means of a wire running through the greenhouse, instead of through the smoke-pipe of the furnace. Not only could a very long wire be used in this way, giving a far more positive action on the lever than would be possible with a wire running only through the smoke-pipe, but a wire through the house would have the great advantage over the other of responding to sun heat; so that the unexpected clearing of the sky in a cloudy day would be immediately followed by the checking of the fires, which might even, by the exercise of a little ingenuity, be accompanied with the automatic opening of some of the ventilators. Many of the large commercial greenhouses are three hundred feet long, with nothing to obstruct the stretching of wires under the roof from end to end. A zinc wire, which would perhaps be the best thing to use for the purpose, extending through such a building, would expand or contract with immense force, at the rate of about an inch for every ten Fahrenheit degrees' variation in temperature; and with two or three ordinary bell-cranks the dampers of a furnace could be controlled in this way with great precision.

IT is interesting to know what other people think of us, even if their opinion is not always so flattering as we would like to have it. The *Moniteur des Architectes* has recently published some clever etchings of architectural subjects, and, among others, a particularly pretty one of a country house by a gentleman well known to the younger generation of our architects, Mr. Cass Gilbert. Although the picturesqueness of the design seems to have captivated the etcher, it has evidently startled the critic who comments upon the drawings published. Following, as the plate does, some illustrations of the simple and dignified design for the new buildings of the Ecole Centrale, the critic, in passing from his description of one to the other, exclaims, "What a contrast to this is presented by the American architecture!" "In the latter," he continues, "classicalism completely disappears, and outline gives place to detail. For characteristics of this school we find absurd plans, unmeaning, strange or grotesque façades, but details often extremely charming." "Observe," he says, "the plan, the façade of this dwelling; could anything be imagined more ignorant or worse studied! Yet notice, in the midst of all this carelessness, the detail of the entrance porch; how pretty, interesting and useful. Look also at the little balcony overlooking the water, and see how pleasant life must be in that house; yet with all this, what gables on top of gables; what strange openings and curious balustrades! How an architect must have to torture his mind to invent such things!"

ON the whole, this is not, from a Frenchman's point of view, an unfair criticism, and, to our mind, it shows very pleasantly the openness of the French artist's mind to the appreciation of things that are good, even though they may be new. As every one knows who has studied French architecture on the spot, or in the professional journals, the modulus, so to speak, of design in the art is there the public building. Let a Parisian architect have half an acre of ground to cover with stone and timber, and he will astonish you by the variety and effectiveness of his plans and elevations; but to cramp him within the limits of a country house is, apparently, to deprive him of nine-tenths of his ideas, and he is sure to turn out a correct, but bald and unattractive mass, perhaps relieved from perfect barrenness by stripes in the brickwork, or some novel carving on the key-stone of the arches, but inferior in human interest to a Swiss country barn. With us, on the contrary, the unit of design is the small dwelling-house. Of our public buildings the less said the better, but among dwelling-houses American architects feel themselves at home, and they have learned by their own observation the rule which the French architects preserve in tradition, that the surest way to bring the study of an architectural design to success is to utilize the exigencies of the comfortable occupation of the building with which it is concerned as motives for increasing the interest of the exterior. It must be confessed that some of our compatriots follow out this excellent principle with a zeal too little tempered with classic moderation; and that the gables upon gables, porches, balconies, bays and windows of all shapes and sizes which they think will be convenient for the occupants of their houses occasionally become tiresome from their mere variety; but, for all this, the path which they pursue so boisterously may, if it is followed with good taste and discretion, lead straight to the highest achievements of art. The comment which M. Boussard makes upon Mr. Gilbert's design, "How happy life must be in that house!" gives the key to all that is best in American design.

IT is, perhaps, within a few years only that the most talented among the English and American architects, after acquiring a sure and ready command over the resources of architectural outline and light and shadow, have begun to see how these elements may be used as a means of expressing a set of ideas, which have never before been considered worthy of permanent embodiment in this way, although they have long taken their place as the inspiration of works of art of other kinds. The first to enter upon the new field was, perhaps, Mr. Norman Shaw, whose best designs for country houses, instinct with the feeling of pleasant, rural domestic life, were everywhere enthusiastically received, and nowhere with more appreciation than in this country. In him and his equally successful contemporaries American architects seem to have found at last the masters whose art they could learn and thoroughly understand, and upon them has been formed the style which is now spreading through this country with extraordinary rapidity. Imperfectly as it is yet practised, it is constantly improving, and we may well ask whether in it is not to be found the beginning of the national art of the future. Less embarrassed by tradition than any others, our architects have the opportunity, if they will qualify themselves for accepting it, of taking the lead of the whole world in developing a new and great school of artistic expression; and those who do most to help on the work are likely to find their efforts appreciated as those of few of our architects have hitherto been.

STUDIES IN THE RENAISSANCE.—I.



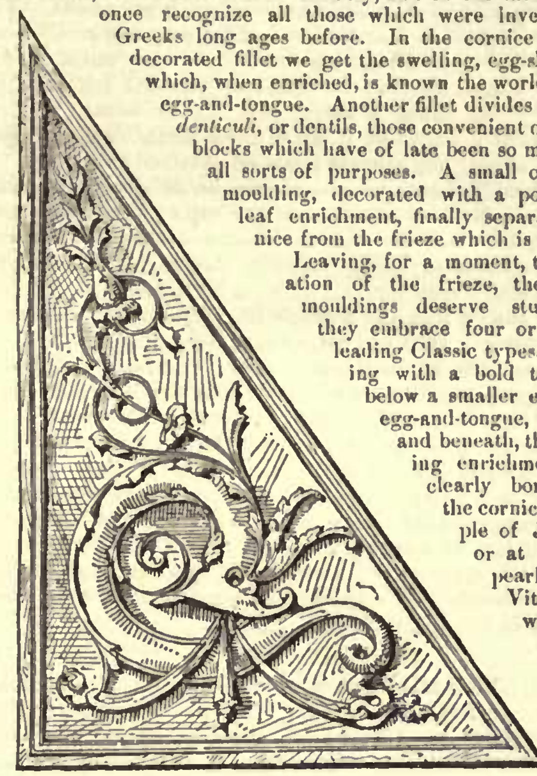
NOW that the Renaissance is again pushing to the front, both as regards architecture and ornament, it is unnecessary to show cause for the appearance in these columns of a series of sketches which have been specially acquired during a recent tour in the land of the first and best *Renascimento*. It is, moreover, hardly necessary to explain at length to the readers of a professional journal, such as this, the Classic forms from which the Renaissance sprang. Such an illustrated exordium would involve a full and complete review of the "five orders," the characteristics of which are now known to nearly every schoolboy; and we therefore think it unnecessary to retail a class of information which, to say the least, is within the reach of any architectural student. We may further state that our principal object in these articles will be to bring to light some hitherto unconsidered and unpublished old studies of Renaissance sculpture, woodcarving and mouldings, and we shall purposely avoid attempting to deal with well-known architectural axioms or examples such as are already amply illustrated and explained in existing works, or accessible in art schools. It will be convenient, then, to assume that those who peruse these fragmentary studies are fairly familiar with the architecture and ornaments of old Greece and Rome. Such an elementary knowledge will be helpful to an intelligent dissection of the examples submitted, and will also enable the reader to fully detect and appreciate those elements which the Renaissance grafted on Classicism.

Our initial cut forms a most fitting commencement to this series of chats on the Renaissance, for it shows the end of one of the eighty-eight manuscript stands, or *plutei*, which the prince of sculptors, Michael Angelo, designed for the renowned *Biblioteca Laurenzia* in Florence. This famous library was founded by Duke Cosimo in 1444, and was gradually enlarged by succeeding princes of the Medici down to the time it fell into the hands of the great artist, for finishing, early in the sixteenth century. He it was who designed the staircase, the ceiling, and last, but not least, the woodwork to which we now draw attention. It was with no ordinary interest we inspected this phase of his work, because his name is generally and more immediately associated with some masterpiece of painting, sculpture or architecture, rather than with the modest wood-carvings of a library interior. These old Florentines were truly great in the way in which they could descend to little things. The sculptor of "Moses" was able, if need be, to transfer his labor from the dome of a cathedral to the designing or carving of a simple panel, and that without any sense of the lesser work being *infra dig.*

The panels on the ends of these *plutei* are, as far as we could discover from a cursory glance, all different and full of that rare vigor and originality which characterized the Renaissance, especially when rendered by the masterly hand of Michael Angelo. To make more clear the suggestions which these scraps are intended to convey, the panels on the end of this reading-desk are given herewith at a larger size than was possible in the initial cut, and the *motif* is thus more readily discernable. The form and mouldings which Michael Angelo employed are those of Classic times, but they are reclothed with a force and grotesqueness which were unknown either to Greek or Roman.

This intimate association of the antique with the elements of the *cinque cento* is perhaps better illustrated by some of the fine old wood-carving which is to be seen in the Palazzo del Commune, at Pistoja, the ancient and somewhat artistic little town, north of Florence, wherein pistols were first produced, and whence they are said to have derived their name. We did not come across, in all our wanderings, a piece of interior woodwork that so fully set forth the borrowed as well as the later features of the Renaissance. It is hardly less interesting than the building which contains it, which happens to be a fine example of the Italian Gothic style, erected between 1294 and 1385. The frescoes within, by Gianicola and his pupils, might well demand notice, were our purpose other than it is. This old edifice is remarkably useful, as illustrative of the beautiful style which preceded the revival. It embodies the style which Ruskin dotes upon, and which is so ably set forth in Giotto's inimitable campanile at Florence.

But to return to our example of Renaissance woodwork; it may not be unprofitable to pull it to pieces in order to discover the subtile differences between the old and the new, but it will be convenient, first of all, to consider it in its entirety, and in the mouldings we at once recognize all those which were invented by the Greeks long ages before. In the cornice beneath the decorated fillet we get the swelling, egg-shaped ovolo, which, when enriched, is known the world over as the egg-and-tongue. Another fillet divides this from the *denticuli*, or dentils, those convenient quadrangular blocks which have of late been so much used for all sorts of purposes. A small ogee or cyma moulding, decorated with a pointed wavy-leaf enrichment, finally separates the cornice from the frieze which is below.



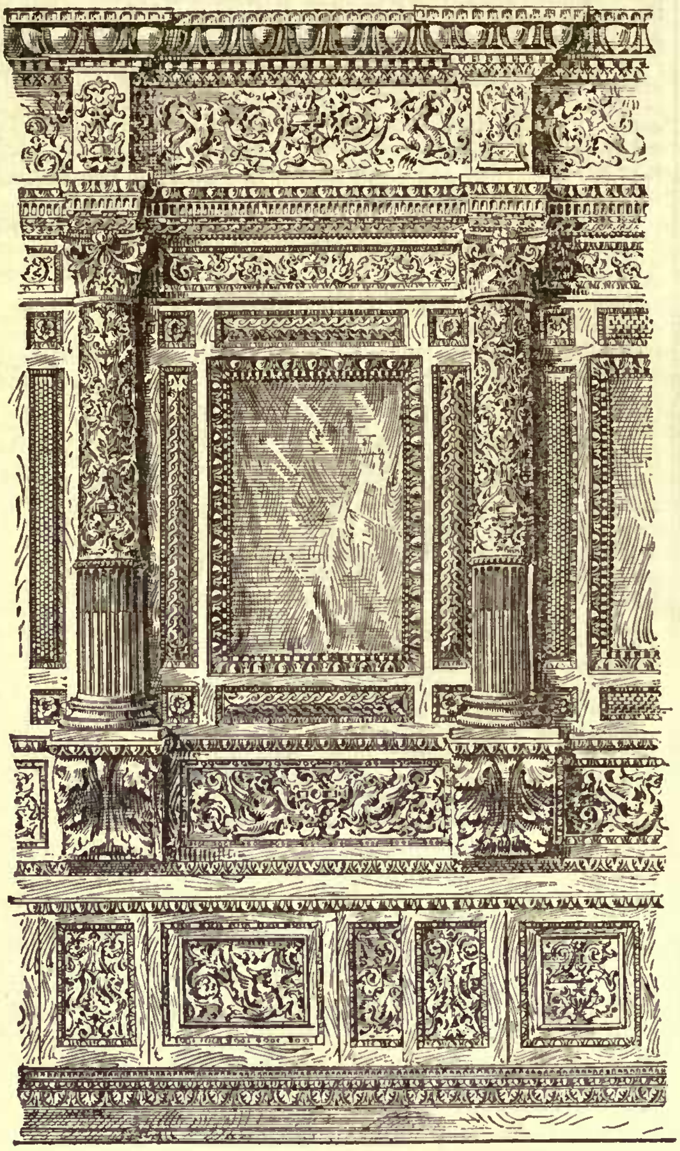
Leaving, for a moment, the consideration of the frieze, the architrave mouldings deserve study, because they embrace four or five of the leading Classic types. Commencing with a bold tenia, we get below a smaller edition of the egg-and-tongue, then a fillet, and beneath, that close fluting enrichment which is clearly borrowed from the cornice of the Temple of Jupiter Stator at Rome. The pearl beading and Vitrovian scroll which are introduced below the fluting are also found upon nearly every temple of pagan times. The double *guilloche*, or scroll pattern, which, figuring in the small panels, surround the larger panels below, is another well-worn enrichment on old mouldings. The mouldings which are used in the lower part below the panelling, the dado, are for the most part merely replicas of those above, and need not be described here. The panelling of the lower part, just above the wainscot, is confused in arrangement, which arises from the fact that the woodwork has been clumsily patched in order to hide decay in that particular spot. We thought it better to sketch it just as it is, rather than attempt any such restoration, even on paper, as is Professor Ruskin's pet aversion. Speaking critically, the mouldings of this old work are really overdone with enrichment, and yet the decorations are so well adapted to the shapes of the various members, that the lines of the construction are not lost.

The credit of this appropriate enrichment really belongs to the old Greeks. What could be better for the ovolo than the egg and tongue, an enrichment of which we never weary, or than dentils for breaking up the tenia? The pearl-bead mouldings for the fillet, or the fret for the faciæ, are most fitting enrichments for such positions.



The frequent retention of these decorated mouldings by the carvers of the Renaissance epoch, men who remodelled whenever and wherever they could, can only be accounted for by the fact that the moulding enrichments of the ancients were practically unimprovable. Having, then, established the fact that the general lines and mouldings of this woodwork are almost entirely Classic, we may proceed to meet the question, "In what respect does this example betray a Renaissance feeling?" Like most of such work of this period, the new life, so to speak, is to be found in the carving. As we have already shown, the Italian artists of the fifteenth and sixteenth centuries adopted, without much amendment, the general lines of their predecessors. Just as the student who would become perfect master of figure subjects must begin by accepting the skeleton as the foundation of his studies, and then proceed to clothe it with muscle, flesh and skin, so the artists of the Renaissance accepted, apparently without much question, the fully developed skeleton of their new style from the ancients, merely reserving to themselves the right of giving it more muscular energy, and finally dressing it up in any fantastic

garments that they conceived to be fitting. An examination of our enlarged sketches of the carvings which adorn this old woodwork at Pistoja will make clear what we mean. In the larger sketch, which



shows all the mouldings, we get some remarkable specimens of conventional enrichment. It is true that we have a couple of chimerical creatures embodied therein, such as are found on the temple of Minerva, at Ægina, and a dozen other temples, but in no case are they rendered in such an extraordinary and conventional manner as



in this. The designer has so contorted and individualized his chimera that it distinctly differs from any known example of ancient art, while, at the same time, the antiquity of the *motif* is obvious.

Here, then, is the beginning of the new departure for which we are looking. The same lesson is taught in the other and smaller piece of carving, which we have selected from another portion of the frieze. Again we get these grotesque animals with singularly prolific tails, and also a curious winged head, but they are of a different pattern from the others. All the panels on this woodwork differ in this way, for replicas, or machine-carved repetitions, were not tolerated in *those* days, and thus the charm of "variety in unity," or *vice versa*, distinguishes this and all similar relics of that really artistic epoch. This latter sketch also shows more clearly than the others the broad and vigorous style of cutting, which is the charm of this old carving. It is left "clean" from the chisel, and has a breadth about it which is all too seldom seen in such work now-a-days. In this originality of treatment and variety of detail, we begin to discover wherein the Renaissance differs from the Classic. The old Greek or Roman would have carefully, and, doubtless, with commendable taste, repeated his anthemion, intertwined fret or scroll-work, each form being quite academic, all along his frieze; but his copyist of Pistoja freely interprets some of the old forms, twists them about as he pleases, and evidently prides himself on having no two



panels of his frieze, or any other panels, exactly alike. Further than this, he serves up a modified edition of the Corinthian column, beautifies its shaft with a rich arabesque of his own creation, and flutes and reeds the lower part and base in a way which, though devoid of Classic authority, invests it with the richer clothing of the Renaissance.

There is yet another point about this carving which may be noted with profit, and that is the admirable way in which the carving is distributed over, or "covers," the surface which it is intended to decorate. Looked at from the distance, it presents the appearance of even enrichment, and no one form preponderates over another, or disturbs the general lines of the structure. This can be clearly seen by looking at our general sketch a little distance from it. In this work, ornament, although there is too much of it, is clearly subservient to general form and construction, as, indeed, it always should be. It was when, some century or more later, ornament became constructive, that the decline of this great style set in, and that it was finally reduced to the meaningless contortions of the Rococo.

We shall furnish other studies of the Italian Renaissance for a future number, and as evidence that the Italian is in the ascendant just now, we may mention that Mr. Henry Irving has just had the interior of his theatre, the Lyceum, entirely redecorated, and he has adopted Italian of the period in which Raphael decorated the beautiful Loggia of the Vatican, the paintings being executed by hand on a flat ground, panelled in with massive mouldings. It is from the Vatican Loggia, from the cloisters of the monastery of St. Paolo, at

Parma, from the Massimi Palace, and from the Villa Madama, at Rome, that the forms of ornament have been principally adapted. A white ground shows up the rich, pure coloring and the gold mouldings very strikingly, the effect being at once enhanced and kept in key by the sober background of walls, covered by an old Italian pattern in two shades of greenish blue, and by hangings of rich ambertoned yellow, lined with cerise. This last is repeated in the plush covers of the arm-rests above the gold mouldings in front of the several tiers. In accord with the box fronts, the circular ceiling is in Raphaelesque taste, and has divisions containing each a medallion, the subjects severally being Homer, Sophocles, Aristophanes, Menander, Euripides, Plautus, Æschylus and Serentius. Round the base of the ceiling, immediately above the cornice, is a frieze of boys playing musical instruments; and this frieze or zone, being painted in a neutral blue on a gold ground, agreeably breaks the scheme by defining one of its main portions.

Over the proscenium arch are groups of boys emblematically personifying, on a background of blue sky and fleecy clouds, the various functions of acting, music, and dancing.

Mr. C. J. Phipps the eminent theatrical architect, has carried out the work under Mr. Irving's direction.

J. WILLIAMS BENN.

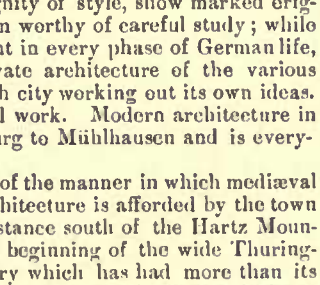
EISENACH.



Sketch Plan of the Wartburg

PERHAPS the most interesting route to follow in seeing Germany is to begin at the north, where both nature and the architecture are utterly flat and uninteresting, thence working southward through the great forests and across Bavaria, and finally leaving the country with the glories of the Rhine provinces fresh in the mind. In this way both the natural attractions and the artistic productions of human labor constantly improve in quality and interest as the journey advances; and provided one is not entirely fleeced by the Rhenish hotel keepers, one will be quite apt to forget the dreary monotony of the northern counties, and think only of Germany as it appears at its best. Nowhere, however, except possibly on the Rhine, is there architecture, ancient or modern, of such merit or individuality as is found in Italy or southern France. The Germans as a race have certainly never been monument makers, and their public buildings, with a very few exceptions, are quite insignificant. But on the other hand their buildings for private purposes, while never rising to a dignity of style, show marked originality to a degree which makes them worthy of careful study; while the trait of individuality so prominent in every phase of German life, gives a pleasing variety to the private architecture of the various provinces, each state and almost each city working out its own ideas. Of course this applies only to the old work. Modern architecture in Germany is the same from Königsburg to Mühlhausen and is everywhere commonplace.

One of the most pleasing examples of the manner in which mediæval German life found expression in architecture is afforded by the town of Eisenach, a little village some distance south of the Hartz Mountains, nestled among the hills at the beginning of the wide Thuringian forest, in a district of the country which has had more than its share of the wild legends and romantic tales of early days, and where, if in any place, one might expect to find the picturesque and quaint. Eisenach is a junction for trains from several directions, and the busy station looks anything but mediæval. A few minutes' walk, however, brings one to the Nicolai Thor, a huge, time-stained mass of stonework rising over a wide-arched passage, and with the buildings clustered about it, forming one of those strikingly picturesque arrangements which raises a query in the mind why it is that the nineteenth-century architects cannot occasionally build things carelessly and "out of skew," and produce an effect as pleasing as this bit of hap-hazard. And passing under the arch into the wide square beyond the retrospect of the Thor is even more striking than the first view; the black shadows and browns and red of the gateway on one side, on the other a fine old Romanesque tower, building up from the converging roofs of the Nicolai-Kirche and the parsonage, while a bit of bright foliage and the sharp perspective of the street fronts fill out the picture at the extremities. Such is the entrance to Eisenach. Once inside the town the interest centers chiefly about the associations connected with names of great men who have lived in this little place, rather than about the architecture, though in the narrow meandering streets there are many picturesque bits of old half-timbered work, and even an attempt at magnificence in the market-place in the shape of a stucco palace erected by Duke Ernest of Weimar in 1742; all of which, however, is more apt to find its way into a painter's portfolio than into an architect's note-book. Back of the market facing a little square is a quaint, roomy-looking building, wherein Martin Luther lived as a school-boy with the Widow Cotta, in 1498. It is one of the most pleasing houses of the village, and its attractiveness is not marred even by the small vender of Luther relics who occupies the corner and is a thorn in the flesh of all strangers. In a side street is another neatly-kept house, wherein John Sebastian Bach and his twelve boys, or part of them at least, were born and flourished; and in still another street a tablet indicates the birthplace of Preller, the painter.


The Nicolai Thor from the Outside.

Eisenach by itself is simply a picturesque little Thuringian village, but it derives an added interest from the old castle of the Wartburg, which towers far above it on the hill towards the south-west; perhaps the best existing type of a mediæval *schloss*, a fortress and a ducal residence; and one of the very few examples of domestic Romanesque architecture which German revolutions and French invasions have left unmolested. Of course it has been restored and repaired from time to time, but it appears to have been dealt with gently, and it undoubtedly presents to-day much the same appearance it did in the twelfth century, when it was the residence of the art-loving Landgraves of Thuringia, who were wont to call about them the best the land could produce, and were the patrons of artists and minstrels. The castle was begun and occupied by Lewis the Springer in 1070, and has never ceased to be at least nominally the residence of the ruling prince. It is at present a country seat of the Grand Duke of Weimar, and since 1847 has been cared for by the general government, and the restorations conducted under the direction of the architect, Herr von Ritgen. Indeed, Protestant Germany may well cherish the Wartburg, for it was almost the cradle of the Reformation, and it was here that Martin Luther, escaping from both Pope and Emperor after the famous diet of Worms, was held in half confinement but perfect safety from his foes, while his surplus energies were expended in translating the Bible.

The castle is built on the crest of a long narrow hill, five hundred and sixty-five feet above the village. The path to it leads up through long reaches of magnificent forest growth and around great masses of moss-covered rock, the buildings being all the while hidden by the thick foliage, until a sharp turn in the road discloses the tall sandstone towers and picturesque lines of half-timbered work rising high above. Another turn brings one before the outer guard-post, where the Government is represented by a ponderous-looking fireman, with a ferocious beard, and armed with one of those absurdly old-fashioned axes, which for some inexplicable reason every German fireman wears belted to his side. Just below the castle some one with an eye to the picturesque and to tourist's pocket-books has erected a quaint-looking country inn, with ample barns and hay-sheds stretching down the hillside. There is no broad road leading to the castle gate, but a narrow path winds around the rocks and up to the light draw-bridge. Everything is kept in mediæval trim. Even the barbed portcullis is only propped up by a slight timber; and as one passes under the low-browed arch and up the steep passage into the outer court, it is easy to understand why the castle should have been considered impregnable before the days of cannon and bombardments.

The Wartburg is composed of a number of buildings united by passages, and enclosing two irregular courts. Luther inhabited the portion on the left of the outer court, shown by the sketch. This court-yard presents a very picturesque appearance, with the strongtoned red-sandstone, the wide-ribbed half-timbered work on either side, and the dainty little Gothic oriel. The windows are glazed with leaded roundels; a fantastically wrought gargoyle spouts out from the corner; there are delicious half-tones about the stucco-work between the timbers; vines are trailed prettily over portions of the stonework; here is a half-effaced coat-of-arms over the side door, through which the great reformer was wont to pass; and there a vacant shrine nearer the archway; the tile roofs are softened to a pale reddish yellow; on the right, the long lines of the timbered gallery melt into a mass of green foliage, only tinged by a slight foretaste of autumn. Altogether it is a grouping such as one will find hardly anywhere but in Germany; perhaps not architectural in the highest sense, but appealing so strongly to the natural love for the picturesque as to make one almost wish that architecture were nothing more than picture-making, and that no sterner tasks were required of the student than to sketch — for such things can be but faintly transferred to paper—and linger over delightful bits like this.

The curious are at liberty to inspect the room in which Luther lived. It is barren and cheerless enough now, though we are assured it has not been disturbed since he left it. The room is scantily furnished with a few articles which were used by the reformer; his bedstead, his bookcase, the desk where he translated the Bible, and his un-easy chair. On the wall is the spot which received the bottle of ink Luther flung at the devil's head; at least so the attendant said, and we all know Luther was tempted and did fling ink at something. There are also some indifferent portraits of Luther and Melanchthon, and a few time-stained autographs.

The inner court is more architectural, but less interesting. On the left is the Landgrafenhaus, where the master of the castle abode, and does still, for that matter, when the Arch-duke comes hither on a vacation. The exterior is strongly Romanesque in character, as will be seen by the detail of one bay, given on the sheet of sketches. The

interior has been most lavishly restored and decorated in all the magnificence with which a powerful landgrave of the sixteenth century is supposed to have surrounded himself. In this wing of the castle is the chapel, decorated in better taste than some of the other apartments, and a little gem in its way; its square room, with low vaulting springing from a single shaft in the centre, windows on three sides filled with rich-toned stained-glass presented by members of the Royal family, heavy draperies about the pulpit and altar, and a golden crucifix before the window. The chapel is now a right royal place of worship, though it is very doubtful if Luther ever had so fine a place to preach in.

In the upper story of the Landgrafenhaus is the sumptuous banquet-hall, extending into the pitch of the roof with carved open trusses, and all ablaze with polished woods, gilding and rich ornament applied in a semi-Byzantine style — reprehensible as architecture, if enticing as decoration. Visitors are also allowed to wander through the rooms where the old Landgraves administered their summary judgments; the Sängersaal where contests were held between the great rival minstrels of Germany as far back as 1190; and through a long hall decorated with scenes from the life of St. Elizabeth, who was a châtelaine of the Wartburg. And of course the castle has its *Rüstkammer*, filled with old suits of armor, curious weapons, headsmen's axes and other reminders of the way those old heroes had of convincing each other. In one corner of the court is the bear's pit,—no German castle is complete without some such attraction; and opposite the Landgrafenhaus are the stables, in a wide spreading half-timbered house, with richly-carved corner-posts and gargoyles. At the southern extremity of the castle walls rises a tall, cumbersome watch-tower, commanding the entire country for miles around, and affording beautiful views of the dark-wooded Thuringian hills, with Eisenach nestling among the trees far below.

The Wartburg is not an architectural monument. It is simply a charmingly picturesque bit of mediævalism preserved almost intact to our day, a taste of the romance which is as much a part of the profession as scientific planning or daring construction. We cannot all build monuments, any more than we can all be picturesque; but we cannot visit Eisenach and the Wartburg without feeling that perhaps those old Germans were wise in neglecting the monumental, for they surely succeeded best with the picturesque. C. H. Blackall.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

CHURCH OF GRAVILLE, END OF THE NORTH TRANSEPT. [1]

Except towards the west end, which is in ruins, and has quite lost the portal and towers that flanked it, the church of Graville still continues tolerably entire: in its style and general outline, but particularly in its central tower and spire, it bears a considerable resemblance to that of St. George de Bocherville. Architecturally regarded, however, it is inferior to that noble edifice; but the end of the north transept, selected for the subject of the present plate, will, in point of interest, scarcely yield to any other building in Normandy. The row of sculptures immediately above the windows is probably unique; among them is the sagittary, very distinctly portrayed, and near him an animal probably designed for a horse, whose tail ends in a decided fleur-de-lys, while he holds in his mouth what appears intended to represent another. The same style of art as the most barbarous at St. George's, and not less fanciful. The interlaced arches with flat surfaces, that inclose the windows immediately beneath the sculptures, may be matched by similar rows in the exterior of the abbey church at St. Stephen, at Caen, and on the end of the north transept of Norwich Cathedral. It appears likewise from Mr. Carter's work, "*Early English Architecture*," that others resembling them line the lowest story of the east end of Tickencote Church, as a specimen of true Saxon architecture; whereas it may safely be affirmed that there is no part of it, as figured by him, but may be exactly paralleled from Normandy. The same may also be said of almost every individual instance that he has produced as illustrations of the style in use among our Saxon progenitors. In Graville, a series of similar arches is continued along the west side of the north transept; and, judging from the general appearance of the church, it may be believed that it is of a prior date to any of the others just mentioned. A considerable portion of the monastic buildings is still remaining; but they are comparatively modern; — a lithographic plate of this monastery was published in Paris, by Bourgeois in 1818.

ACCEPTED DESIGN FOR THE Y. M. C. A. BUILDING, RICHMOND, VA. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

The building will be sixty feet front on Main Street, by one hundred and ten feet on Sixth Street, instead of sixty feet by one hundred and twenty-four feet, as contemplated in the competitive designs. The material will be granite to the level of the first-story windows, above which it will be of stretcher bricks in red mortar, with courses of buff Ohio-stone and ornamental terra-cotta. The basement will contain, besides cellars and dressing-rooms, a bowling-alley and a commodious gymnasium, the greater part of which will extend to the second-floor level. The first floor will contain, besides the entrance-hall, a reception-room, parlor, library, reading-room, etc. A wide stair leads to the second story, which will be divided into class and committee rooms, boys' reading-room, etc., and a hall to seat seven hundred persons, with stage and gallery. The third floor contains class-rooms, janitor's quarters, etc. The roof is to be covered with slate. The finish to be in white pine with some rooms in redwood. It is intended to keep the cost within about $30,000.

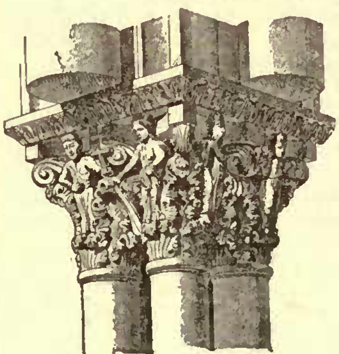
PUBLIC SCHOOL-HOUSE, HANOVER, PA. MR. J. A. DEMPWOLF, ARCHITECT, YORK, PA.

This structure is of common brick jointed in red mortar, with Ohio-stone trimmings and terra-cotta panels. The main building, covering a ground area of about thirty-five hundred square feet, is two stories in height, with a one-story rear annex twenty-nine feet by twenty-nine feet, the whole comprising five school-rooms, and the necessary board, recitation and retiring rooms. The staircase is of iron, wide and of easy rise. Special attention has been given to make the means of communication and egress ample and commodious. The total cost has been upwards of $12,000.

SKETCHES IN THE WARTBURG, EISENACH, GERMANY, BY MR. C. H. BLACKALL.

For description of these sketches, see article elsewhere in this issue.

CHEMISTRY OF PIGMENTS.[2] — II.



From the Cloister of Monreale Sicily.

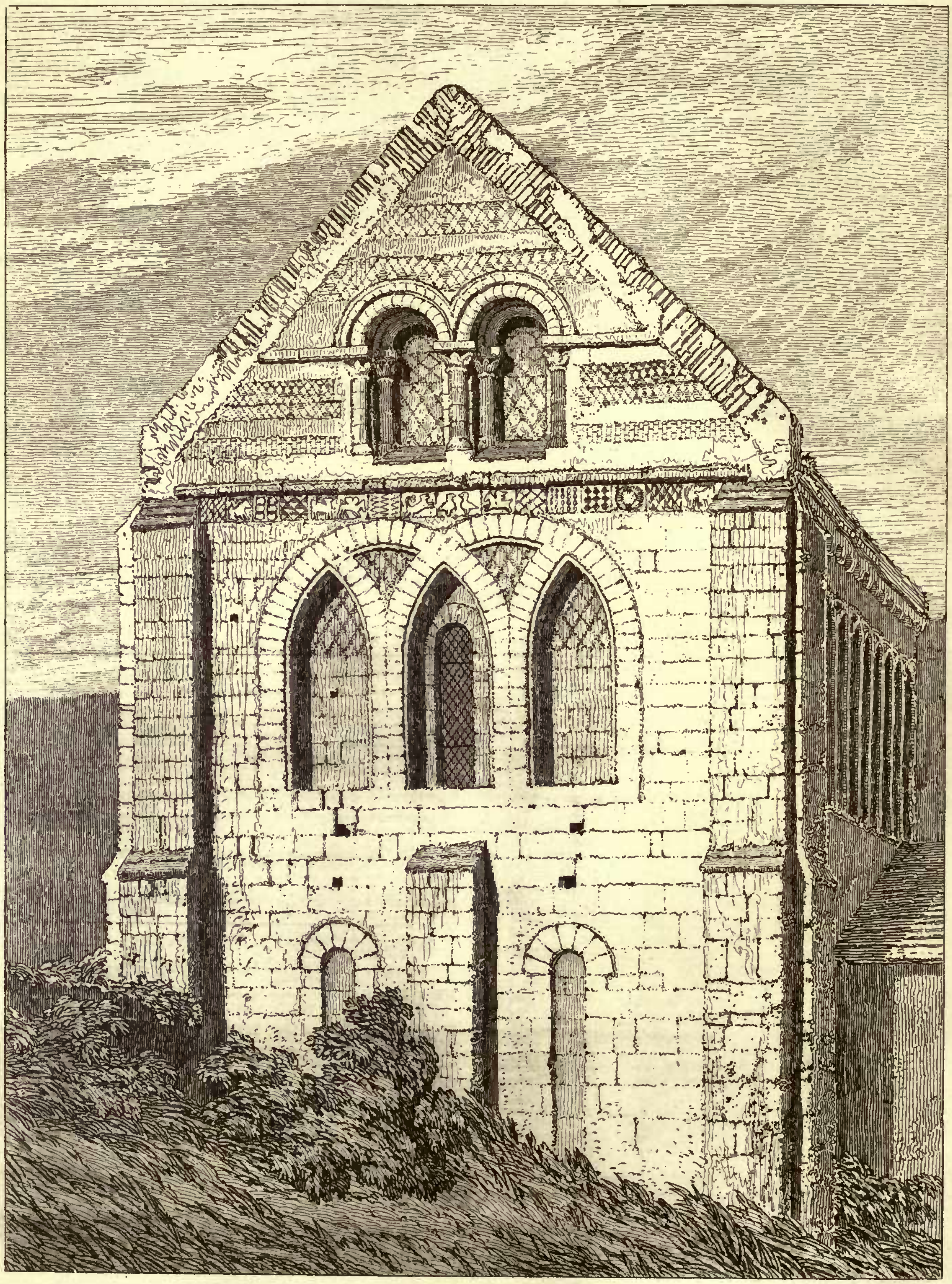
In my first lecture I considered certain pigments yielding white, red and yellow colors, describing to you shortly their methods of formation, and, in certain of them, the means by which their ordinary impurities might be detected. In this, my second lecture, we will consider some instances taken from the common green and blue pigments; and it is my wish, in the case of some of these substances, to go a little more fully into methods illustrating their examination and analysis.

Green Pigments. — *Chrome Greens.* — As I was speaking in my last lecture of the yellow pigments derived from chromium, I will commence my lecture to-night with the green pigments which are also obtained from compounds of that metal. You will recollect that, in speaking of the yellow pigments containing chromium, I spoke of the chromium being in the acid condition, as chromic acid combined with other metals, such as lead, barium, zinc, etc. The green pigments, however, derived from this metal, except in one or two cases, are all more or less oxides or hydrated oxides, which compounds yield us pigments varying very much in hue, according to the method adopted in procuring them. To show you how much the presence of water combined with these oxides, and the temperature at which the body is formed, may affect the color, I will here precipitate a substance of this kind, according to the different conditions. For this purpose I use a salt of copper, which metal we shall find yields us various green colors through its compounds. Taking a solution of copper sulphate, and dividing it into two portions, I boil one portion over the lamp, and whilst this is warming, I add to the cold portion a solution of caustic potash. You see at once a light blue precipitate is formed, which is apparently perfectly stable in its color. On filtering this body and drying, it is found on analysis to be a hydrated oxide of copper, represented by the formula $Cu(OH)_2$. Now taking the boiling solution of copper sulphate, and adding to that some warm potash solution, you see a totally different result, the precipitate in this case being of a dense brownish black color. At the temperature of boiling water, 100° Centigrade, the water does not unite with the oxide, which is therefore precipitated as a black body of the composition CuO. This simple instance will, I think, show you how easily the substances may take different colors in their preparation.

The different greens which owe their color to the chromium oxides, either hydrated or otherwise, are generally prepared by heating some volatile salt of chromium, by which process the chromium oxide remains behind; or by decomposing other more important salts with different reagents. Thus, by heating ammonium bichromate, the ammonia is driven off, and the chromium absorbing oxygen from the air, becomes converted into the oxide. The same decomposition takes place when mercury chromate or bichromate is decomposed by heat, which is done by placing this chromate in a retort, and raising the temperature. The mercury distils over, and may be collected in suitable vessels, whilst the chromium oxide is left behind as a brilliant green of considerable depth of color. Bichromate of potassium may also be decomposed by hydrochloric acid in quantity just sufficient

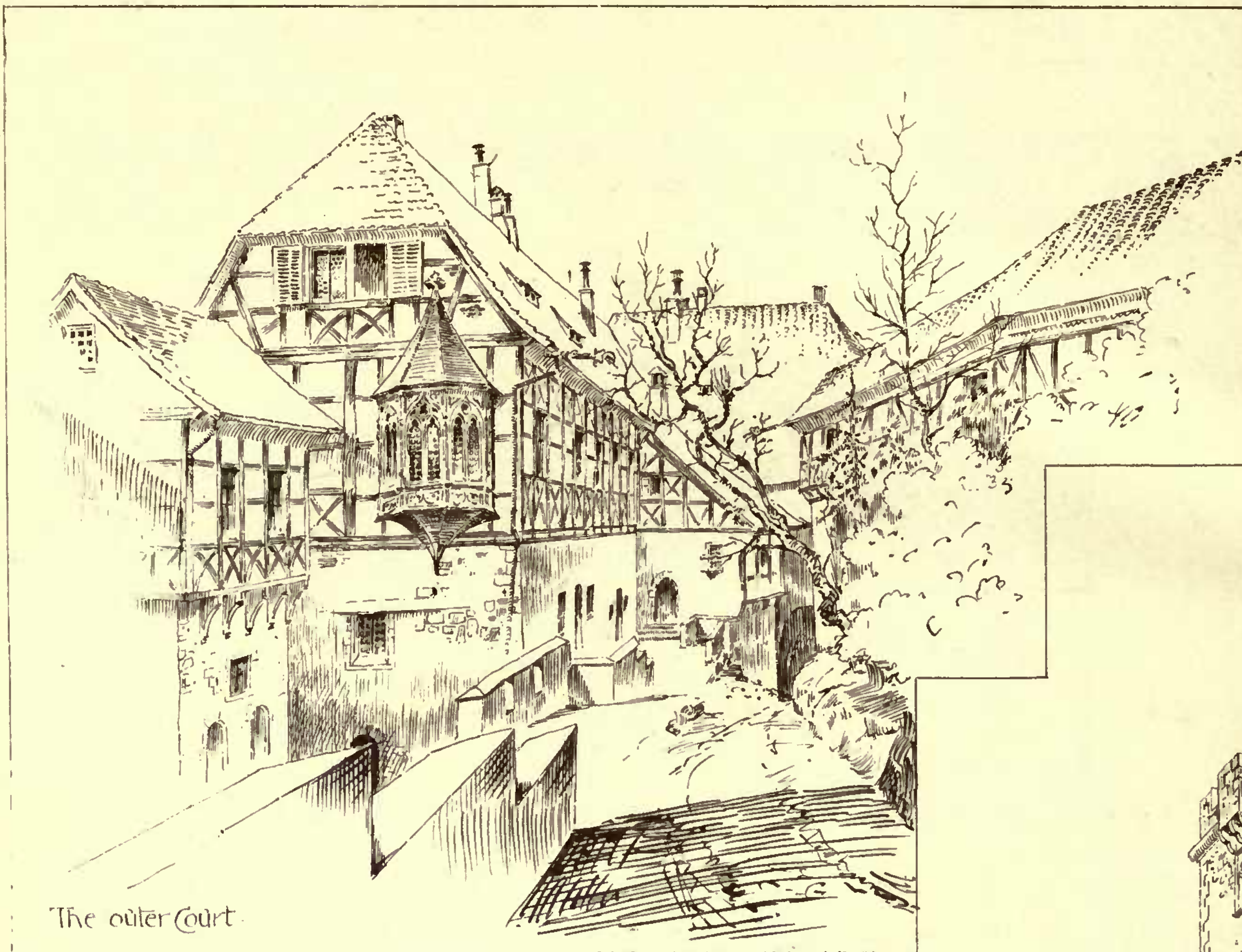
[1] From Cotman's "*Antiquities of Normandy.*"

[2] A lecture by J. M. Thomson, F. R. S. E., F. C. S., Demonstrator of Chemistry at King's College, delivered before the Society of Arts, and published in the *Journal* of the Society. Continued from page 171, No. 511.



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CHURCH OF GRAVILLE.



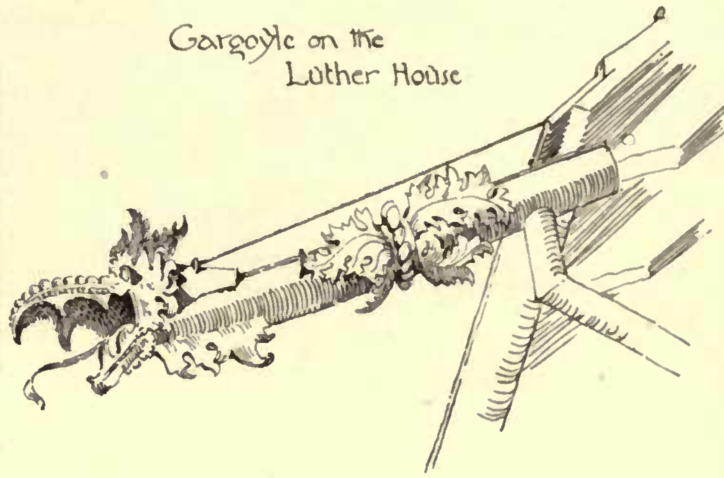
The outer Court

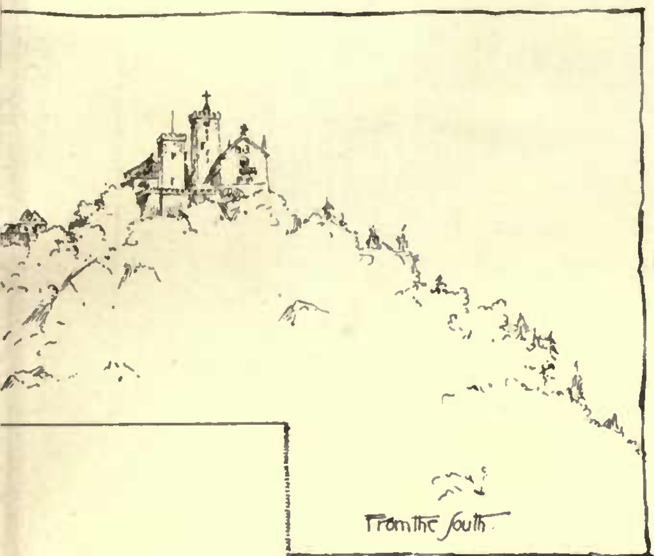


Detail from the Inner Court



[J. R.] OSGOOD & CO

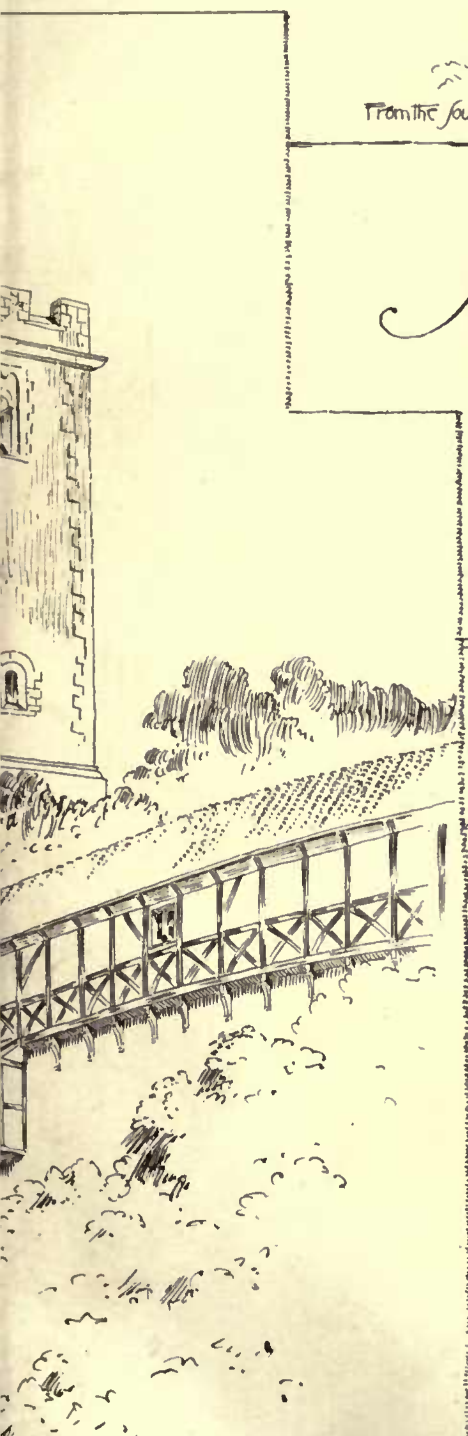

Gargoyle on the Luther House


From the South.

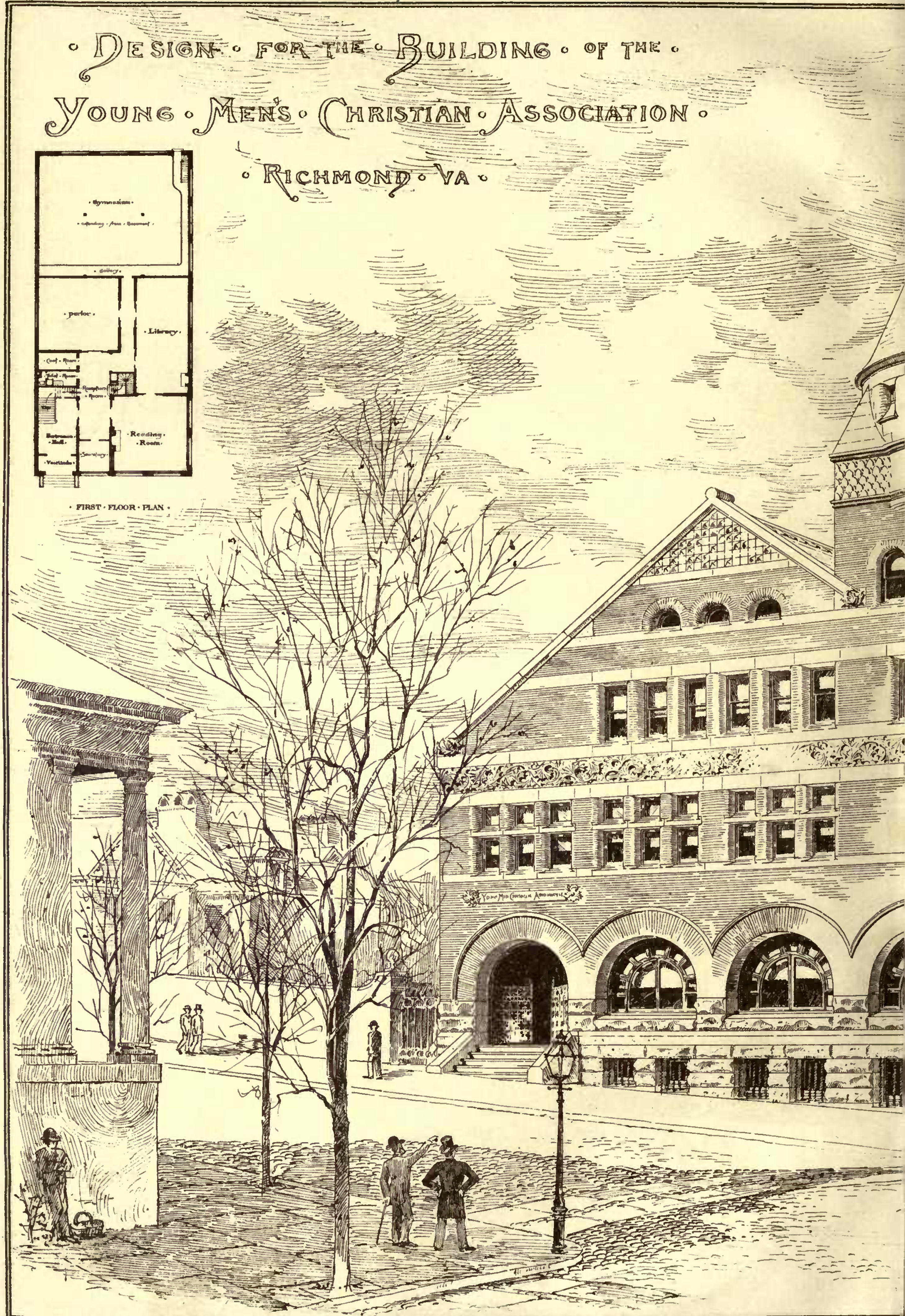
Sketches · from · the · WARTBURG · · Eisenach ·

by C·H·Blackall·

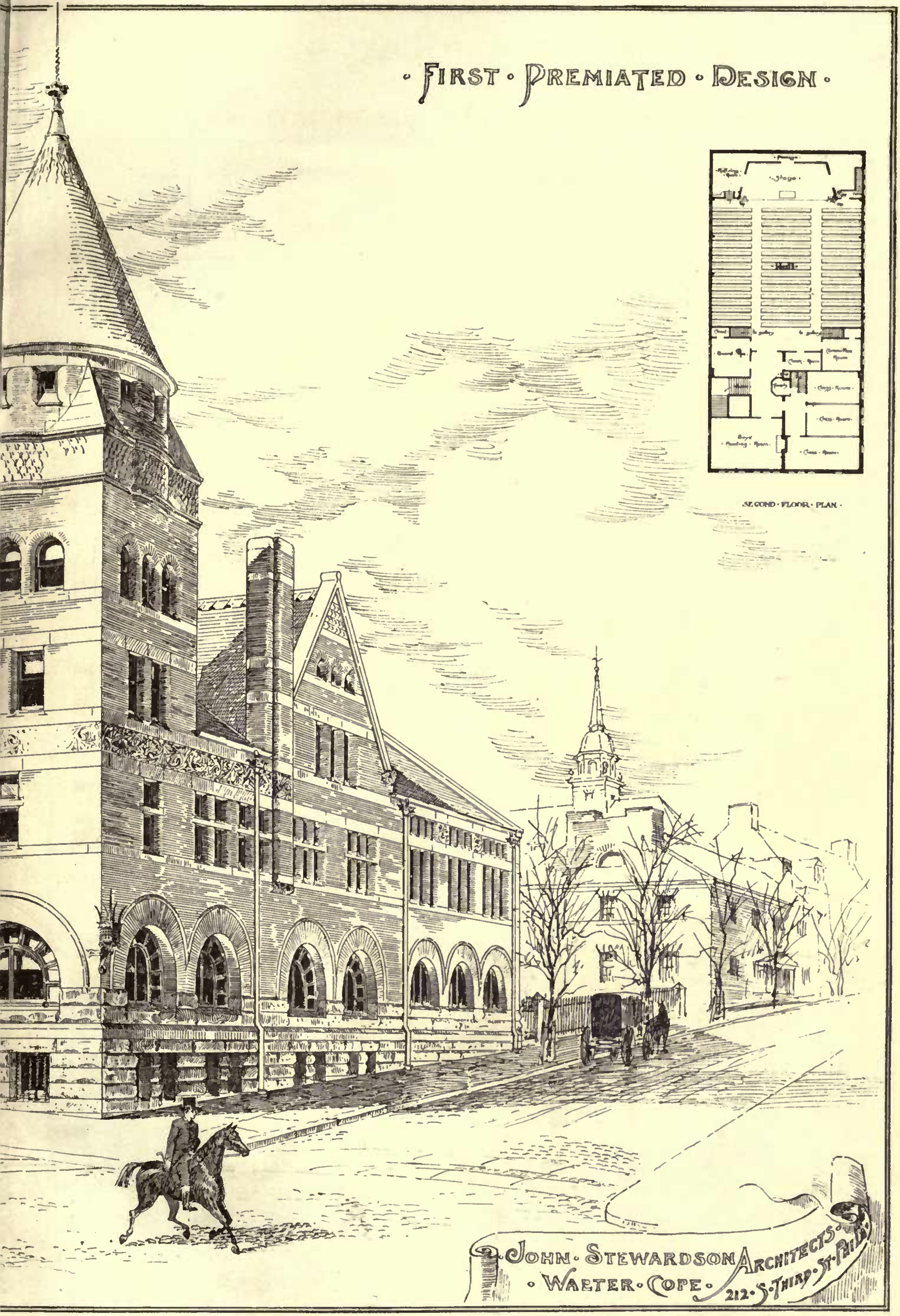

The Chapel.


·From the Outpost·

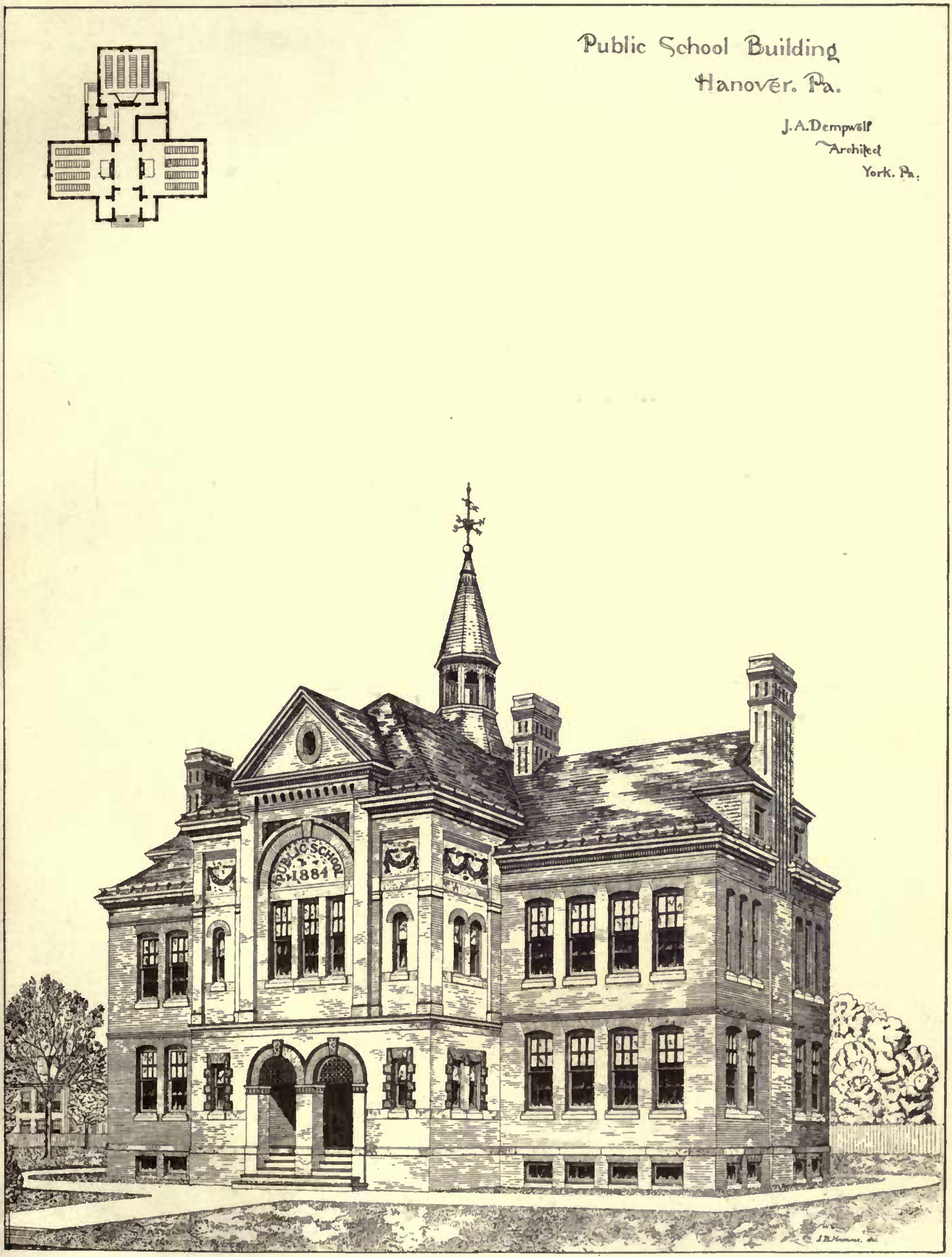
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DESIGN FOR THE BUILDING OF THE
YOUNG MEN'S CHRISTIAN ASSOCIATION
RICHMOND VA
Gymnasium
Gallery
parlor
Library
Reading Room
Secretary
Vestibule
FIRST FLOOR PLAN

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to combine with the potassium when potassium chloride will be formed, and chromium oxide. Such a decomposition may also be decomposed by hydrochloric acid in quantity just sufficient to combine with the potassium, when potassium chloride will be formed, and chromium oxide. Such a decomposition may also be carried out by adding sulphur to a boiling strong solution of the bichromate just mentioned, when a hydrated oxide of chromium is precipitated; this body must first be dried, and finally calcined at a moderate temperature. By fusing together the bichromate and sulphur, and, when cool, extracting with water the potassium sulphate formed in the reaction, the same green may be obtained. A fine apple-green color may be made, by treating the residue left in the retort after potassium bichromate has been treated with sulphuric acid, with boiling caustic potash or soda, the chromium oxide being formed. Prepared in this way, the substance has a beautiful green color of considerable power. "Veridian" is another green of great brilliancy and permanency, also formed from chromium oxide, this body being in the hydrated condition. To form this green, potassium bichromate is decomposed by ammonium sulphate, in the presence of just sufficient warm water to render the mixing of the bodies possible. The material, on cooling, is broken in pieces and heated, for a short time, to a temperature not exceeding 200° Centigrade, when the water and ammonia pass off, leaving the hydrated chromium oxide. This powder must be thoroughly washed with water to remove potassium sulphate, but even with many washings, the pigment is found still to contain traces of that body. It may also be prepared by calcining potassium bichromate and boracic acid, subsequently lixiviating the broken mass to remove free boracic acid and potassium borate. This form of the pigment is known under the name "Vert de Guignet."

The greens derived from chromium may be regarded as colors of great stability, as they do not decompose other colors, and are themselves unacted upon by sulphuretted hydrogen gas, light, or air.

Scheele's green.—This pigment I now bring before you as it has been employed in more common painting work, and being of an extremely poisonous character, I wish to show you how materials colored with this paint may be examined for the poison. This pigment, in a state of purity, is a neutral copper arsenite, but the substance employed in the arts generally contains considerable quantities of copper oxide. The color cannot be said to be thoroughly permanent, as it is altered by air, more especially in a moist atmosphere, and is entirely decomposed by the action of heat. This paint has been employed to a great extent in the coloring of inferior classes of wall-paper, and when so employed has proved extremely deleterious to the health of persons inhabiting rooms so papered. The manner of examining this pigment for the arsenic may be carried out in the following ways. Should the pigment be obtained in the state of powder, it may be introduced into a retort such as you see arranged on the table, and treated with strong hydrochloric acid. The retort should be connected with a condenser and a quill receiver, the end of which dips under a little water. On the application of heat, the volatile arsenic chloride distils over, and is condensed in the water in the receiver. More water is then added to the condensed liquid, and sulphuretted-hydrogen gas passed through it, when a precipitate of the yellow arsenic sulphide shows the presence of arsenic. This precipitate may be confirmed for arsenic by treatment with ammonium carbonate in slight excess, when it should entirely dissolve. When the green pigment has been spread on wall-paper, a preferable method is, after cutting the paper in small strips, to treat it with a little caustic ammonia, when should there be Scheele's green in the pigment, the paper will probably turn blue from the action of the ammonia on the copper. After leaving the ammonia to act for a short time, the liquid must be rendered slightly acid with hydrochloric acid, the shreds of paper filtered off, and the solution boiled with some slips of metallic copper. In the slightly acid solution, a deposition of metallic arsenic takes place upon the copper, causing it to assume a steel-gray color. The slips of coated copper may now be removed from the solution, slightly rinsed with cold water, dried by gently pressing between blotting paper, and heated in a small glass tube closed at one end, when the arsenic becomes converted into arsenious acid, which condenses in small crystals on the sides of the tube. For the direct examination of a pigment such as "King's yellow," which is unacted upon by acids, the best plan is to fuse the substance with some reducing agent, such as sodium carbonate mixed with potassium cyanide or charcoal in a small tube, when the arsenic is evolved, and condenses round the upper portion of the tube as a black ring of metallic lustre. Another pigment, namely, "Schweinfurt green," also contains arsenic, and may be regarded as an "aceto-arsenite of copper," being formed by the treatment of verdigris with acetic and arsenious acids. Both these pigments are highly dangerous to health, especially when they are employed in the coloring of internal walls, as in many cases, the paint having been put on with an insufficiency of size, small particles come off, and becoming mixed with the particles of dust, are breathed by those inhabiting the rooms.

"*Verdigris*" was originally used to a considerable extent as a green pigment, but it cannot be recommended, as it undergoes change both by moisture and sulphuretted hydrogen. In certain cases also it has been found to undergo a darkening in color, probably under the action of reducing agents. It may be regarded as a "sub-acetate of copper," but varies to some extent in its composition among the different varieties that are made. Many other greens containing copper exist, among which the most important are "Mountain green," formed from native malachite or copper carbonate; "Bremen green," or "Mineral green," which are hydrated oxides of copper; and "Brunswick green," which has for its basis copper oxychloride. Most of these pigments, if pure, are of good color and permanent, but, in the case of Brunswick green, it is to be found frequently formed from a mixture of Prussian blue, chromate of lead, and barium sulphate, which, reacting on one another, cause the original green to assume a brownish tint.

An extremely beautiful and permanent green, which has received the name of "*Rinman's green*," or "Cobalt green," may be formed by calcining the precipitate produced by sodium carbonate in a mixture of cobalt and zinc sulphates, and consists of a mixture of the oxides of these two metals. Some recommend that the cobalt and zinc salts should be precipitated with potassium phosphate or arseniate, this giving a richer color with more body. The arsenious acid in this case apparently undergoes volatilization, and is not retained to any extent by the resulting pigment. Green pigments may also be obtained from the metals manganese, uranium and titanium, but they are not of much importance.

Blue Pigments.—The blue pigments most commonly employed are derived chiefly from the compounds of iron and cobalt, with the exception of ultramarine—which contains silica and alumina in varying proportion—and one or two blues derived from copper compounds.

Ultramarine.—I bring this color first under your notice from the great beauty and purity of its color, and the perfect stability the pigment possesses when mixed with other paints, or in the presence of noxious gases. It consists of silica and alumina, accompanied with smaller quantities of soda and sulphuric acid. From the rarity of the mineral "lapis lazuli," which furnishes the natural ultramarine, this form of the pigment is very expensive, but the "artificial ultramarine" is manufactured in large quantities at a moderate cost, and is very good in color and stability. The artificial variety is prepared by fusing together white clay, dried sodium carbonate, sulphur and charcoal, which yields a mass of so-called "green ultramarine." This, however, on being washed, dried, and again roasted in thin layers with sulphur, gradually forms the blue variety. As already stated, the color may be regarded as a permanent one, except when it comes in contact with acids, which exercise a bleaching action upon it. There are two forms of artificial ultramarine, one of which is termed "Guimet's," and the other "Gahn's."

This latter body is a compound of cobalt oxide and alumina, and does not seem to possess a definite chemical composition. By varying the proportions of cobalt, a more or less decided shade of blue may be produced; but it seems essential that the metals iron or nickel should be absent from the pigment. It mixes well with other colors, without producing any deterioration, but is liable to appear of a purple shade when viewed by artificial light.

Thenard's Blue.—This is another blue containing cobalt, and somewhat similar to the pigment just described. It is formed by mixing the pink gelatinous precipitate, obtained by adding sodium phosphate to a cobalt salt, with alumina, and after drying, heating the mixture to redness in a crucible. Thenard's blue, when carefully prepared, is reported as an extremely permanent color, notwithstanding the action of heat, light, noxious gases, and even acids and alkalies. Under certain circumstances this color loses its pristine brilliancy; but this may readily be restored to it by heating the pigment with a small quantity of mercury oxide. The mercury volatilizes, and the oxygen passing to the pigment, revivifies it in a very decided manner, pointing to the fact that the brilliancy of the paint probably depends on the state of oxidation of cobalt in the mixture.

Smalt.—This color is well adapted for coarser kinds of work, but is not much used in the fine arts. It may be regarded as a double silicate of potash and cobalt, in fact, glass colored blue by cobalt, and then crushed to a fine powder. The pigment is prepared on a large scale by roasting cobalt ore, which converts the larger portion of the metal into oxide, but still leaves a considerable quantity of arsenic and sulphur in the ore. The residue is then fused with potassium carbonate and crushed quartz, which forms the double silicate of cobalt and potassium, while the other metals, such as iron, copper and nickel, combining with the arsenic and sulphur, form a slag at the bottom of the crucible. The blue glass is poured into water so as to render it more friable by the sudden cooling. The intensity of the color depends upon the quantity of the double silicate which the pigment contains, and the absence of iron in any quantity. It varies from a clear to a decided blue in shade. To be of good quality smalt should not be at all sandy in its nature, but should be in fine powder, holding together like flour; and when thrown into water, the deposit should exhibit the same tint all through.

Cœlin or Cerulean Blue.—This pigment is probably a compound of cobalt and oxide of tin, this body being accompanied by a certain quantity of calcium sulphate. It is a beautiful transparent blue, with a slight greenish tinge.

Prussian Blue.—Under this title may be arranged all those blue pigments which are known under the names of Antwerp, Berlin, Paris and Turnbull's blue, and which have been considered as different compounds of iron with cyanogen, but which may often possess an identical composition. In these colors we find the iron, which is combined with the cyanogen, in two conditions, one of which is termed the ferrous (Fe''), the other the ferric (Fe''') condition, and the color of the body produced varies according to whether the iron salts employed are in the one or other condition. The cyanogen compound which is generally taken to form these pigments is the potassium ferrocyanide or yellow prussiate of potash; and I will now show you the

difference in the body produced according to the iron salt employed. In these two jars I have solutions of ferric chloride and ferrous sulphate; now I add to both of them a solution of potassium ferrocyanide, when you see a deep blue precipitate formed in the jar containing the ferric salt, but in the jar containing the ferrous salt, a very much lighter body is obtained: the first of these bodies prepared in the proper manner constitutes the true "Prussian blue." When a solution of ferric sulphate is added to potassium ferrocyanide, a variety is obtained, which is soluble in water, and which is employed to a great extent by calico printers under the name "soluble Prussian blue." This variety contains potassium as well as the iron and cyanogen, and may be represented by the chemical formula ($K_2Fe_2Fcy_2$). When, however, potassium ferrocyanide is added to ferric sulphate, the precipitate formed is insoluble in water, and may be represented by the formula (Fe_4Fcy_3).

Prussian blue may also be prepared from the green vitriol or ferrous sulphate, but in this case the substance formed must be exposed for a considerable time to the air, as the precipitate at first obtained is nearly white in color, having a different composition ($K_2Fe''Fcy$); this body, however, on exposure, becomes converted into the true Prussian blue by oxidation. I can easily show you the formation of this white variety, and its subsequent change into the blue, by shaking some iron filings with a solution of sulphurous acid, and filtering this into a solution of weak potassium ferrocyanide, when you perceive a dense white precipitate is at once formed. On pouring this, as I now do, onto a plate, you perceive that immediately it changes to a light blue, finally becoming much deeper in color round the edge of the mass where the action of the air is more acute.

The blue pigments derived from these sources are moderately permanent, except in the presence of alkalies, which rapidly decompose them with the formation of ferric oxide. This decomposition may be seen when I treat this Prussian blue, which I have here suspended in water, with some warm caustic potash, the alkali rapidly decomposing the blue, and changing it into a brown powder. The formation of these different substances may be seen in the diagram on the wall, where the first equation represents the formation of the variety insoluble in water; the second and third the formation of the white variety from green vitriol, with its subsequent change into the insoluble blue pigment; and the fourth the formation of "soluble Prussian blue."

$$\text{I.}\quad 2Fe_2(SO_4)_3 + 3\,K_4\,Fcy = 6\,K_2\,SO_8 + \overbrace{Fe_4\,Fcy_8}^{\text{Insoluble Prussian blue.}}$$

$$\text{II.}\quad K_4\,Fcy + Fe\,SO_4 = K_2\,SO_4 + \overbrace{K_2\,Fe''\,Fcy.}^{\text{White variety.}}$$

$$\text{III.}\quad \overbrace{6(K_2\,Fe\,Fcy)}^{\text{White variety.}} + O_3 = 3\,K_4\,Fcy + Fe_2\,O_8 + \overbrace{Fe_4\,Fcy_8}^{\text{Insoluble Prussian blue.}}$$

$$\text{IV.}\quad 2K\,Fcy + Fe\,(SO_4)\,3 = 3\,K_2\,SO + \overbrace{K_2\,Fe_2\,Fcy_2}^{\text{Soluble Prussian blue.}}$$

Little care is taken in the purification of the yellow prussiate of potash for the preparation of the common blue pigment, but it must undergo recrystallization for the preparation of the pure variety of blue, which is sold under the name of "Antwerp blue."

Mountain blue is a basic copper carbonate, somewhat resembling the green carbonate in its constitution. It is very difficult to obtain the substance in a state of purity, and many experiments have been made to obtain, artificially, a pigment which will possess a color resembling the natural body. The best results in this direction are probably those of Pelletier, but the artificial variety, however well prepared, does not possess the permanency which belongs to the natural variety used by the older painters, and still to be seen in a brilliant condition in some of their fresco paintings.

The qualities to be sought for in all pigments, whether taken from a natural source or artificially prepared, may briefly be stated as follows: — The substance should have great richness in the special tint required, and as great durability as possible. It should cover the surface to which it is applied with ease, and for this purpose it must possess the property of mixing thoroughly with the vehicle in which it is suspended. It is essential that the pigment should be insoluble in water, and should dry properly when spread on the canvas. Finally, care must be taken in the selection of the different colors to see that no substances are employed which will produce decomposition with other pigments. This can only be attained by the colorist paying attention to the nature of the ingredients, with due regard to their chemical constitution. The latter precaution has become all the more necessary from the introduction in later years of artificially prepared pigments, which although presenting greater variety of tints, have not that stability which characterized the more simple natural bodies employed by the older painters, and which has permitted such pigments to withstand the action of exterior agents for so long a time. Much depends also on the nature and purity of the vehicles with which the pigments are spread, and the varnishes which are used for the subsequent preservation of the pictures. I should have liked, had time permitted, to have taken into consideration some of the more important chemical points with regard to the nature of such vehicles, and their probable action on different pigments, but I find it impossible in the space at my disposal to carry out this wish.

TABLE I.

SOME OF THE MORE COMMON PIGMENTS, WITH THE CHEMICAL SUBSTANCES FROM WHICH THEY ARE DERIVED.

White	Cremnitz white	White lead	$[PbCo_3.\ Pb(OH)_2]$.
	Chinese white	Zinc oxide	ZnO.
	Flake white	Basic nitrate of bismuth	$[Bi(NO_3)_3.\ 2Bi(OH)_3]$.
	Pearl white	Bismuth oxychloride	$[2(BiCl_3.\ Bi_2O_3).\ H_2O]$.
	Constant white	Barium sulphate	$BaSO_4$.
		Barium tungstate	$BaWO_4$.
	Tin white	Tin binoxide	SnO_2.
Yellow	King's yellow	Arsenic sulphide	As_2S_3.
	Cadmium yellow	Cadmium sulphide	CdS.
	Platinum yellow	Platino-chloride of potassium	$(PtCl_4.\ 2KCl)$.
	Turner's yellow; Mineral yellow	Lead oxychloride	$(PbCl_2\ 7PbO)$.
	Turbith mineral	Basic mercury sulphate	$(HgSO_4.\ 2HgO.)$
	Chrome yellow	Lead chromate	$PbCrO_4$.
	Zinc chrome	Zinc chromate	$ZnCrO_4$.
	Lemon yellow	Barium chromate	$BaCrO_4$.
		Strontium chromate	$SrCrO_4$.
	Naples yellow	Oxides of lead and antimony	$PbO + Sb_2O_5$.
	Yellow ochre	Ferric hydrate and clay	$[(2Fe_2O_3.\ 3H_2O). + Clay]$.
	Mosaic gold	Tin bisulphide	SnS_2.
Red	Red lead	Lead oxides	$[3(PbO).\ PbO_2.]$.
	Vermilion	Mercuric sulphide	HgS.
	Purple red	Basic mercury chromate	$(HgCrO_4 - HgO.)$.
	Iodine scarlet	Mercuric iodide	HgI_2.
	Realgar	Arsenic sulphide	As_2S_2.
	Red ochre; Colcothar	Ferric oxide	Fe_2O_3.
Green	Chrome green	Chromic oxide	Cr_2O_3.
	Cobalt or Rinman's green	Oxides of cobalt & zinc	$(CoO + ZnO.)$.
	Mountain green	Green malachite	$[(CuCO_3.\ Cu(OH)_2]$
	Scheele's green	Copper arsenite	$CuHAsO_3$.
	Verdigris	Basic copper acetate	$[Cu(C_2H_3O_2)_2.\ CuO.6H_2O]$.
	Emerald green	Acetate and arsenite of copper	$[Cu(C_2H_3O_2)_2.\ CuHAsO_3]$.
	Terre verte	Clay colored with iron and manganese	
Blue	Ultramarine	Silicate of aluminium and sodium with sodium sulphide	$Na_2\ Al_2\ Si_2\ O_3\ Na_2\ S_3$.
	Mountain blue	Blue malachite	$[2\ (CuCo_3).\ \ Cu\ (OH)_3]$.
	Smalt	Cobalt and potassium silicate	$CoK_2\ SiO_4$.
	Antwerp blue; Insoluble Prussian blue	Ferric ferrocyanide	$Fe_4\ Fcy_3$.
	Soluble Prussian blue	Potassio ferric ferrocyanide	$K_2\ Fe_2Fcy_2$.
	Indigo		$2\ (O_3\ H_3\ N_3\ O_2)$.
Brown	Manganese brown	Manganese dioxide	MnO_3.
	Vandyke brown	Ferric oxide	
	Burnt sienna; Burnt umber	Clays colored with oxides of iron and manganese	
Orange	Orange chrome	Basic lead chromate	$PbCrO_4\ PbO$.
Black	Black lead	Plumbago or graphite	Carbon + ash.
	Mineral black	Impure graphite	Carbon + ash.
	Lamp black	Soot from resins or tar	Artificial varieties of charcoal with greater or less impurities
	Diamond black	Impure lamp black	Artificial varieties of charcoal with greater or less impurities
	Spanish black	Charcoal from cork	Artificial varieties of charcoal with greater or less impurities
	Ivory black	Charred bones	Artificial varieties of charcoal with greater or less impurities
	Blue black	Charcoal from vine twigs; Cocoa nut and peach stones	Artificial varieties of charcoal with greater or less impurities

TABLE II.

PIGMENTS LIABLE TO CHANGE UNDER THE INFLUENCE OF SULPHURETTED HYDROGEN, AIR AND MOISTURE.

White	Cremnitz white. Flake white. Pearl white.
Yellow	Turbith mineral. Chrome yellow. Mineral yellow. Naples yellow.
Red	Red lead. Purple red. Iodine scarlet.
Green	Verdigris. Scheele's green. Emerald green. Mountain green.
Blue	Prussian blue. Antwerp blue.
Orange	Orange chrome.

TABLE III.

PIGMENTS LITTLE LIABLE TO CHANGE UNDER THE INFLUENCE OF SULPHURETTED HYDROGEN, AIR OR MOISTURE.

White	Zinc white. Constant white. Barium tungstate. Tin white.
Red	Vermilion. Red ochre. Indian red. Madder lakes.
Yellow	Yellow ochre. Barium chromate. Zinc chromate. Aureolin. Platinum yellow. Raw siena.
Green	Chrome greens. Cobalt green.
Blue	Ultramarine. Smalt. Thenard's blue.
Brown	Vandyke brown. Raw umber. Burnt umber. Manganese brown. Sepia.
Black	Ivory black. Lamp black. Indian ink. Graphite.
Orange	Orange vermilion. Burnt siena.

TABLE IV.

PIGMENTS LIABLE TO DETERIORATION WHEN IN CONTACT WITH WHITE LEAD.

Yellow	Yellow orpiment. King's yellow. Indian yellow. Gamboge.
Red	Iodine scarlet. Cochineal. Carmine.
Orange	Golden antimony sulphide. Orange orpiment.
Green	Sap green.

TABLE V.

PIGMENTS WHICH ARE LITTLE AFFECTED BY HEAT, AND MAY BE EMPLOYED WHEN THE MATERIAL HAS TO STAND THE FIRE.

White	Tin white.		Cobalt green.
	Barium white.	*Blue*	Smalt and royal blue.
	Zinc white.		Ultramarine.
Red	Red ochre	*Orange*	Burnt siena.
	Venetian red.		Burnt ochre.
	Indian red.	*Brown*	Burnt umber.
Yellow	Naples yellow.		Manganese brown.
	Antimony yellow.	*Black*	Graphite.
Green	Chrome greens.		Mineral black.

SOCIETY REPORTS.

THE ARCHITECTURAL ASSOCIATION OF MINNESOTA.

THE thirty-sixth regular monthly meeting of the Architectural Association of Minnesota was held on November 3d, at the office of H. S. Treherne. The Committee on Membership reported favorably upon the names of James S. Kenney, James R. Torrance, and Chas. A. Forbes, who were duly elected members. In response to a letter received from the President of the Western Association of Architects, concerning the Minnesota contingent at the St. Louis Convention, the Secretary stated to the meeting that he had sent the names of nineteen members to Secretary Gay, and that since he had written he had learned of six or seven more members who proposed going to St. Louis, so that he felt confident that at least thirty architects from St. Paul and Minneapolis would attend.

The following names were proposed for membership: Charles A. Joy of St. Paul as Fellow; J. B. Hawley, Geo. W. V. Yule, W. A. Truesdell and Samuel Rockwell of St. Paul and W. H. Dearborn of Hamline as Associates; and L. W. Rundlett and Talbot Jones, M.D. as Honorary Members. Dr. Jones read a paper on "The Nature of Zymotic Poison." After describing the contagious character of the diseases generated by this poison, which diseases were denominated as small-pox, scarlet fever, measles, diphtheria, typhus and typhoid fevers and cholera, he said that there were two theories regarding its nature, viz.: the germ and the physico-chemical theory. Believers in the former maintain that zymotic diseases are caused by microscopic living organisms, which, entering the blood, set up morbid or zymotic changes characteristic of the specific organisms, each infectious disease having its specific germ. He elaborated the germ theory, showing that putrefaction is caused by germs which, the germ theorists allege, in densely populated places, are floating in myriads in the atmosphere, and only need a congenial soil such as dead organic matter or a weakly organism to work their reproduction. Germs require morbid conditions for their existence. The opponents of the germ theory contend that such organisms are the result of morbid conditions of their habitat. According to the physico-chemical theorists, living organisms also present in putrescent fluids are mere harmless concomitants, having no causal connections with their medium, and that their life conditions are in reality not matters for the pathologist, but for the naturalist. He closed without giving his sanction to either view. He admitted that it was a complex subject, and that the only human zymotic poison discovered was that of small-pox.

Capt. James Starkey read a paper on "Harmony," in which he advocated greater harmony between the architects, the building inspector and the contractors and builders; and suggested a series of general meetings under the auspices of the Association, to consider and revise the present building ordinance of St. Paul. After the paper was generally discussed, a committee consisting of Messrs. Millard, Bassford and Stevens was appointed to arrange for such public meetings to consider and suggest amendments to the building ordinance.

FIRE-PROOF FLOORING.

ST. LOUIS, MO., October 24, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,— The undersigned, having read the "Notes of Travel in Vienna," by Mr. C. H. Blackall, describing the new Court Theatre, and published in the September 29th number of your paper, wishes to call Mr. Blackall's attention to the fact, in answer to his assertion of not having heard of the method of "fire-proofing" floors in America, which he illustrates, that the very method has been used for quite a number of years by the undersigned, here in St. Louis, in some of our principal and model public school buildings, he having also used the method extensively in Paris. The method is similar to the one described by Mr. Blackall, varying somewhat in detail, which, if not encroaching too much upon your valuable space, might be well again explained.

The beams used are ordinary I-beams of such sizes as location may warrant, spaced from three to four feet on centres. Over the tops of these beams are placed, every four feet, what in Paris are called *entretoizes* or shoulder-hooks, which are of seven-eighths inch square metal, resting on the lower inside flange of the beams and lapping over the top around the outside upper flange of beams. On these shoulder-hooks are placed the *côtes de vache*, or cow ribs, of one-fourth inch square iron, and spaced equally, two between every four feet. On this frame-work, then, is poured the plaster-of-Paris composition.

Testimony can be given by both the architects and private individuals here to corroborate the use of the above described method of construction in St. Louis. Plastering for such partitions requires to be very light for perfectly straight work. Very respectfully,

JEAN JAMETON.

THE EQUESTRIAN STATUE AT NASHVILLE.

NEW YORK, November 9, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—Of the three presidents of the United States raised to the executive rank from the State of Tennessee, Jackson was the earliest and greatest; it is in his honor that the equestrian statues at Nashville, Washington and New Orleans are erected, and it was so written in my manuscript, and not "Johnson," as printed in your issue of the 7th inst. I am of the opinion, especially after recent developments, that the State would hesitate before giving that honor to the latter statesman.

I was mistaken, however, in regard to the name of the photographer, which is T. M. Schleier, and not *Strack*. By making these corrections, you will very much oblige,

Yours respectfully, O. P. HATFIELD.

November 7, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

In your issue of to-day, page 219, fifteenth and sixteenth lines from foot of first column, I notice a slip to which I would call your attention, as I think but few persons are aware that Nashville, Washington and New Orleans are ornamented by "equestrian statues of *Johnson.*" L. F. R.

[WE suppose others than our correspondents must have smiled at the idea of Andrew Johnson as a "man on horseback." We must shelter ourselves behind the Depew-Grant-Johnson correspondence now occupying so much space in the daily papers, if we would find a valid excuse for allowing the hero of New Orleans to be temporarily unhorsed by the war governor of Tennessee.— EDS. AMERICAN ARCHITECT.]

CONTRACTS AND SEALS.

BROOKLYN, N. Y., October 23, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I appeal to your kindness to favor me with a bit of information, as to whether it is necessary for an architect in New York or Brooklyn to obtain a permit or license for the privilege of drawing up contracts between client and builder for such (client and builder, namely) to sign.

Also, whether it is necessary for the contracting parties to *personally* seal their signatures, or whether it suffices for them to sign opposite seals previously fastened in position by the architect or any other person.

By responding to the above, you will greatly oblige

A SUBSCRIBER.

[ARCHITECTS do not now need a license to practise in New York State: and the drawing of contracts is certainly within the scope of their professional duties.

It is not necessary for the contracting parties to affix seals to their names personally, and signatures are often made opposite seals affixed by the architect or some other person. It is, however, perhaps better to affix the seal at least in presence of the signer, in order that there can be no possible question as to his consent to such obligations as the seal may imply. — EDS. AMERICAN ARCHITECT.]

NEW YORK EXHIBITION OF ARCHITECTURAL DRAWINGS.

November 7, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—Your editorial paragraph in to-day's *American Architect* referring to the exhibition of architects' drawings to be held in connection with the annual exhibition of the Salmagundi Club, gives a wrong impression, which I hope you will correct in your next issue. It is true that the committee in charge have decided not to admit photographs, and for the reason you have named, viz.: that as the members of the Salmagundi Club are not themselves permitted to exhibit photographs, it would be a breach of courtesy on our part to allow them to come in under cover of their generous hospitality. It might be inferred from your editorial that as the Salmagundi Club exhibited only in black and white, the architectural drawings should also be in black and white. This is not correct. The Salmagundi Club permit us to hang all kinds of drawings—water-colors — India-ink washes, sepia, pen-and-ink drawings, or any other kind of rendering, only drawing the line at photographs. Undoubtedly photographs would find a place in an exhibition of architecture: this, however, is intended to be an exhibition of architectural drawings. It is hoped, though, that it will be fully as interesting from the point of view as showing what the architects of the country are really doing, as also showing what our best draughtsmen can accomplish. Specimens of French and English draughtsmen's original work is expected, thereby affording instructive contrasts. Besides this, architectural sketches made by some of our best artists will be hung, showing what it is that appeals most to the artist.

F. A. WRIGHT, *Sec. Committee.*

[Too late to make the proper correction—for it was the last thing written for that issue — we noticed when the press-revise came to hand that our words did convey the impression that exhibitors would be limited in their offerings to black-and-white work alone.—EDS. AMERICAN ARCHITECT.]

PAYING FOR THE USE OF PUBLISHED DESIGNS.

Boston, Nov. 4, 1885.

To the Editors of the American Architect: —

Dear Sirs, — A point arose a short time since in my experience that may be of interest to architects in general, and I present it below, hoping to draw out opinions on the subject. A client, having seen some published plans for a small house by an architect in a distant city, brought them to me to work up, as being, with a few alterations, entirely satisfactory.

The distant situation of that architect, together with some other circumstances, prevented me from sending my client to him, and so, being ignorant of the general practice in such cases, and not wishing to do anything contrary to professional etiquette, I wrote to the architect for permission to use the sketches, and at the same time offered to pay him the customary fee, whatever that was. His reply I give in full, as the best statement of the case from the other side: —

October 26, 1885.

My Dear Sir, — Your esteemed favor of the 22d instant came duly to hand. Its contents has much interested me. You had better by all means assist your client according to his wishes. It is not at all strange that the schedule of charges of the American Institute of Architects does not indicate the solution of the very honorable proposition you make, and I am quite nonplussed to know what is the wisest suggestion to make in the matter, looking at the case from a simply professional standpoint. Of course, any pecuniary consideration that might of possibility be due me would in this case amount to a mere nothing. The principle is, however, the same, and is a very interesting one, I think. If you are willing to take the trouble to ask, say three architects of your acquaintance, their opinion on this point, suppose you do so, and I will do the same. It may be of interest to compare notes. In the meantime, let me assure you of my appreciation of your most courteous and honorable action in the matter. Hoping that a house satisfactory to your client may be the result of our co-labors,

Yours very truly, — — ——

In complying with the above request and conferring with other architects, I learn that there is no rule or established practice that covers this point, and hence this communication, as without doubt the quickest solution of the problem. Hoping that you will give it space at your earliest convenience, I am, Yours truly, C.

NOTES AND CLIPPINGS.

"Professional Books" in the Tariff. — On reading the letter of "A. H." in your paper of October 15, I was led to examine the tariff law, and I find the following provision in the act of March 3, 1883: —

"Section 2503. The following articles, when imported, shall be exempt from duty: . . . . Books, household effects, or libraries or parts of libraries, in use, of persons or families from foreign countries, if used abroad by them not less than one year, and not intended for any other person or persons, or for sale . . . . [two pages intervene], wearing apparel in actual use, *and other personal effects (not merchandise), professional books,* implements, instruments and tools of trade, occupation, or employment of persons arriving in the United States. But this exemption shall not be construed to include machinery or other articles imported for use in any manufacturing establishment or for sale."

It would seem that, under these provisions, both "A. H." and Mr. Warren were entitled to have the articles on which they were forced to pay duty passed free. — *J. R., in the New York Evening Post.*

Steel Punches. — One of the foreman of the Baldwin Locomotive Works, stopping before a little exhibit of steel punches at the Novelties Exhibition, said: "All our great industries are largely dependent upon smaller industries that to the casual observer appear of very little importance. Here, for instance, is a display of punches. They are used simply for punching letters or numbers on the parts of a machine to guide workmen in setting it up, but they are absolutely essential, and it is very important to have them of good quality. Although quite delicate in line they must be clearly formed, of good face, hard enough to be used on iron or steel, and yet not so hard as to be brittle. They require a high degree of skill on the part of the workmen who make them, and yet they appear to the ordinary visitor as of very little importance. Our locomotives are taken apart and shipped to all quarters of the globe, and if it were not for the marks upon the parts made by these little punches it would be an exceedingly difficult job for even our own workmen to put them together again. I enjoy an exhibition of this kind, chiefly because it brings to light so many of the quiet workers whose fame is unsung." — *Iron Age.*

Protecting Washington Monument from Lightning. — The lightning-rod tips, and the rods to which they are to be fixed, intending to protect the Washington monument from lightning, have arrived from Philadelphia, where they were made, and are now being placed in position. The construction of scaffolding around the roof was timed so that it would be in readiness when the rods should arrive, and there will be no delay in the work, except that caused by bad weather. The apparatus constructed in Philadelphia consists of 704 feet of triangular copper rods, plated with gold, to encircle the roof in the horizontal points; two hundred feet of circular copper rods, also gold plated, to extend along the four corners of the roof, and one hundred and seventy-two lightning rod points. The latter are three inches long, made of copper and gold plated, with the exception of a half-inch at the end, which is of platinum. These one hundred and seventy-two points, together with those erected immediately after the monument was struck by lightning, make two hundred points in all, nearly covering the roof of the monument. In the opinion of the scientists who made the recommendations, these precautions will protect the monument from lightning in the future. — *Boston Herald.*

The Statue of Marcus Aurelius at Rome. — For better preservation the statue of Marcus Aurelius, at the Capitol in Rome, is to be removed by the municipality. In its place is to be set up an exact copy in bronze.

Method of Deadening Sounds in Buildings. — General M. C. Meigs, writes to the *Sanitary Engineer* as follows in reference to an article on deadening the sounds from water-closets, which appeared in a late issue: "I have found it impossible to make myself heard by a person on the other side of a large window, double glazed, interval between panes seven-eighths of an inch. Glass is very elastic, and should, I suppose, therefore, be a good sound-conductor. But the voice cannot be heard through two sheets of ordinary French window-glass separated by seven-eighths of an inch of air. In this, I think, may be found a hint for shutting-off sound."

Early Public Clocks. — The first tower-clock built was the Westminster clock in 1288. A few years later a clock was put up in Canterbury Cathedral, and in 1317 the Exeter Cathedral clock was made. The Westminster clock is the second largest in the world. In point of size the great tower-clocks of the world run as follows: Mechlin (Belgium), forty feet diameter of face; Westminster, twenty-two feet six inches; St. Paul's Cathedral, seventeen feet; Shandon Church (Cork), sixteen feet; Pancras Station, twelve feet nine inches; Scarborough, Old Church, twelve feet; St. James (Piccadilly), ten feet, and King's Cross Station, Bow Church, Manchester Infirmary and Royal Exchange, each nine feet. In this country the two largest are twelve feet in diameter. One of these is the Produce Exchange clock, which, through electrical connection, rings bells throughout the building to notify members of the sessions of the exchange. — *The Metal Worker.*

Sand Bags for Engineering Purposes. — During the war of the rebellion in the United States, sand bags were used for the foundations of fortifications on soft ground, notably during the siege of Charleston, where bags of sand were dumped on a mud bank forming an artificial island, upon which a fortification of sand bags and cotton bales was built of sufficient resistance to carry fifteen-inch "swamp angels," which were used to shell the city some seven miles distant. It had been supposed that all possible points were occupied, and until the use of sand bags was devised, it would have been impossible to erect a fortification upon such material. In concrete work, such as the strengthening of the foundations of the Washington Monument, it is sometimes advisable to apply the material in bags, and afterwards burst them by blows of rammers. A few years ago an inlet of about one-sixth of a mile in width on the eastern coast of New Jersey was closed by an embankment made out of eighty thousand bags of sand, each containing one-twelfth of a cubic yard. The cost of these bags filled and in position was eight-and-one-half cents, or one dollar per cubic yard of embankment. The deposit by the sea began as soon as the current in the channel was stopped, and now one hundred acres of land have been reclaimed. This shore is sandy, and the action of waves and currents serves to wear or build the land very rapidly. — *Engineering.*

Curious Collections. — Mme. Agar, the celebrated *tragédienne*, possesses a collection of toys which she exhibited in 1882, at the Union Centrale. Baron Oscar de Watteville, who only smokes cigarettes, has been making a collection of pipes during the last forty years. The Duke of Richelieu, the prime minister of Louis XVIII., had a splendid collection of pipes, which was rather singular for a man who only took snuff. The late Duke of Zweibrucken, at Carlsberg, left pipes to the value of 100,000 florins. General Vandamme, one of the heroes of the army of Sambre-et-Meuse, died in 1830, leaving a fortune consisting solely of pipes, which realized 60,000 francs at a public auction. M. Maury, of Asnières, is the owner of a collection of marionettes, the relics of the Nicolet, Séraphin and Miniature theatres in the Champs Elysées. This collection is, to say the least, quite as interesting as those of gloves, garters, funeral-cards, match-boxes and military tufts, which some people dote on. Further, we have collectors of door-knockers, shoe-lifters, forks, braces, buttons and shoe nails. Lastly, we note that an amateur at Poictiers has made it his business to rake together all the "bad grammar" of members of the French Academy from its institution down to the year 1885. This imposing collection consists of about 3500 cuttings from books, reviews or newspapers. These the collector bequeathed, oh, irony! to the Bibliothèque Magazine, the library of the Academy. — *Intermédiare des Chercheurs.*

Vibrations of the Flood Rock Explosion observed at Cambridge. — The jocose assertion of the first director of Harvard College Observatory, Professor William Bond, that the ponderous foundation stone on which the great refractor is poised could not be moved even by an earthquake has at last been disproved by observations taken there on the occasion of the recent explosion at Hell Gate. Old Summerhouse Hill itself, upon which the observatory stands, was preceptibly shaken on that occasion, if Professor W. A. Rogers's perceptive faculties were not at fault. The air line distance between the Observatory and Flood Rock is nearly one hundred and ninety miles. Accurate time was kept at both points. The time-keeper at Hell Gate fixed the explosion at precisely fourteen minutes past eleven by the seventy-fifth meridian time. The time reported from Princeton at which the effect was observed there was 11: 14.47. Professor Rogers's observations at Cambridge were: Disturbance first seen, 11: 17.14; instant of maximum disturbance, 11: 18.03; disturbance ceased 11: 20. The figures are all in seventy-fifth meridian, or eastern time. The method used to develop the distance of vibration was the placing of a saucer of mercury on the solid cellar floor. In this mercury was a speck or flaw. Upon this point was brought to bear a microscope of 750 magnifying power, the spider line being in exact coincidence with the flaw. The first vibration perceived was about a thousandth of an inch and recurred at intervals for nearly two minutes, the greatest swaying of the mercury being over a space of one five hundredth of an inch. — *New York Tribune.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

329,456. LOCK.—Albert Kirks, Canton, O.

329,491. BOLT FOR DOOR-LOCKS. — Augustus Schweinfurt, Philadelphia, Pa.

329,497. CARRIER OR ELEVATOR FOR PAINTERS, ETC.—Sigmund Spitzer, Vienna, Austria-Hungary.

329,499. VENEERING. — Charles W. Spurr, Boston, Mass.

329,516. HEATING-STOVE. — William E. Walker and George E. Wilbur, Taunton, Mass.

329,542. WRENCH. — Jas. A. Fairbanks, Augusta, Me.

329,555. RULE AND SQUARE.—Ludwig Hirsch, New York, N. Y.

329,585. AUTOMATIC SPRINKLER FOR EXTINGUISHING FIRES.—Joseph A. Miller, Jr., Providence, R. I.

329,586. KNOB ATTACHMENT. — Samuel D. Montress, Paterson, N. J.

329,616. FLOORING-BOARD. — John R. Baldwin, Montgomery, Ala.

329,648. FIRE-ESCAPE. — Peter Huber, New York, N. Y.

329,651. WINDOW.—George H. King, Salisbury, Mo.

329,660. AUGER-BIT. — Henry S. Lord, Hartford, Conn.

329,669. LUMBER-DRIER. — Aaron S. Nichols, Chicago, Ill.

329,673. DOOR-SECURER. — David H. Parkhill, Jr., Philadelphia, Pa.

329,680. VENTILATOR.—William Scharnweber, Jefferson, Ill.

329,713. DEVICE FOR BENDING ROOFING-PLATES. —Benjamin F. Caldwell, Wheeling, W. Va.

329,740. PAINT FOR ROOFING, ETC. — Frederick M. Hibbard, Gothen, Ind.

329,741. APPARATUS FOR EXTINGUISHING FIRES. —John Hill, Columbus, Ga.

329,747. FIREPLACE. — Molesworth King, Chicago, Ill.

329,759. COMPOUND PLASTER AND SHEET-METAL LINING FOR PARTITIONS, ETC. — Edward C. Morris, Boston, Mass.

329,789. SHEET-METAL ROOF. — George B. Weast, Newville, Pa.

329,799. APPARATUS FOR IMPREGNATING WOOD. —James H. Young, New York, N. Y.

329,803. SASH-HOLDER. — Albert Ayers, Rahway, N. J.

329,804. SASH-FASTENER. — John Y. Bassell, Leesburg, Va.

329,806. URINAL.—James E. Boyle, Brooklyn, N.Y.

329,807. SELF-CLOSING COCK. — James E. Boyle, Brooklyn, N. Y.

329,823. SUPPORTING-BRACKET FOR SPOUTS, PIPES, ETC. — Henry C. Durborow, Indianapolis, Ind.

329,828. WOODEN FLOORING AND WAINSCOTING. —Albert Green, New York, N. Y.

329,856. SASH-BALANCE. - S. Howland Russell, New York, N. Y.

329,857. HEATING-DRUM. — Matthew Ryan, Washington, D. C.

329,872. STONE-CUTTER'S CHISEL. — Thos. Woods, Nicholasville, Ky.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty permits have been granted, the more important of which are the following: —

Thos. T. A. Hitaffer, 6 two-st'y brick buildings, (square), s e Lorman St., w of Fulton St., and 3 three-st'y brick buildings, w s Fulton St., s of Lorman St.

Schauer & Eck, three-st'y brick building, s s Fayette St., between St. Paul and Charles Sts.

John G. Pangborn, three-st'y brick building, w s Madison Ave., between Presstman and Bloom Sts.

J. W. Parks, 11 two-st'y brick buildings, w s Marshall St., between Fort Ave. and Randall St.

J. W. Lindall, 2 three-st'y brick buildings, w s McKim St., between Chase and Biddle Sts.

John Glenn Estate, 3 two-st'y brick buildings, o s, Twenty-foot Alley, e of Calhoun and n of Mulberry St.

Patrick J. King, 2 three-st'y brick buildings, s s O'Donnell St., w of Putuxent St.

Boston.

BUILDING PERMITS. — *Mt. Vernon St.*, near Pleasant St., stable, 20′ x 24′; owner, C. D. Bournan; builder, Samuel Clement.

Main St., No. 461, dwell., 22′ 10″ x 55′ 7″; owner, J. W. Wilson; builder, T. Harrington.

Brighton Ave., near Union Sq., storage, 30′ x 35′; owner, Charles Green; builder, Charles Sabine.

Winthrop St., near Blue Hill Ave., dwell.; 22′ x 30′; owner and builder, C. A. Jefferson.

Winthrop St., near Dennis St., dwell., 20′ x 45′; owner and builder, C. A. Jefferson.

Dorchester Ave., near cor. Locust St., dwell. and store, 30′ x 40′; owner, M. Nolan; builders, Campbell Bros.

Helena St., near Lamartine St., dwell., 25′ x 35′; owner and builder, John Hammerel.

Cambridge St., Nos. 118 *and* 120, mechanical, 20′ x 40′: owners, Dearborn & Co.; builder, A. F. Hyde.

Bowdoin Ave., near Eldon St., dwell., 24′ x 38′; owner and builder, William Hunt.

Bearse Ave., near Butler St., dwell., 20′ x 28′; owner and builder, James Pope.

Granite Ave., near Adams St., poultry-house, 10′ 80′; owner, R. Morehouse; builder, Charles Perere.

Granite Ave., near Milton St., storage, mechanical, 25′ x 38′; builder, City of Boston.

Granite Ave., near Milton St., poultry-house, 76′ x 125′; owner and builder, A. C. Childs.

Brooklyn.

BUILDING PERMITS. — *Stagg St., No.* 267, n s, 125′ w Waterbury St., three-st'y frame store and tenement, tin roof; cost, $5,500: owner, Robert Kramer, 148 Bushwick Ave.; architect, H. Schoeffler; builders, M. Metzen and J. Hesse.

Park Ave., n s, 140′ e Nostrand Ave., 3 three-st'y frame (brick-filled) tenements, tin roofs; cost $4,900; owner and builder, Andrew Hofgesang, 334 Stockton St.; architect, A. Herbert.

Scholes St., n s, 225′ w Waterbury St., three-st'y frame (brick-filled) tenement, tin roof; cost, $5,000; owner, Mrs. Hesse, 100 Scholes St.; architect, H. Schoeffer; builder, S. J. Hesse.

Eldert St., s s cor. Bushwick Ave., 7 two-st'y frame (brick-filled) dwells., gravel roofs: cost, each, $800; owner, F. J. Ledoux, 36 Margaretta St.; builder, I. D. Mason.

South Elliott Pl., e s, 218′ n Lafayette Ave., 2 three-st'y brown-stone dwells, tin roofs; cost, each, $5,000; owners and builders, Litchfield & Dickinson, 214 State St.; architect, C. Werner.

Union Ave., n w cor. South First St., rear, three-st'y brick tenement, tin roof; cost, $4,000; owner, Charles Meyer, Maspeth, L. I.; architect, J. Platte; builder, J. Kanth.

De Kalb Ave., No. 1335, n w s, 350′ from Central Ave., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,600; owner, B. A. Williams, 80 Cedar St; architect, E. Schrempf; builder, J. Schneider.

North Eighth St., Nos. 106-110, s s, 160′ e Second St., 3 four-st'y brick tenements, tin roof; cost, each, $6,000; owners, Wm. Hinck & Co., Third St, cor. North Eighth St.; architect, A. Herbert; builders, Mead & Son.

Hancock St., n s, 80′ w Marcy Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $9,000; owner, George H. Stone, 301 Jefferson Ave.; architect, A. G. Stone.

Vandike St., n s, abt. 150′ e Van Brunt St., one-st'y brick factory, gravel roof; cost, $8,000; owner, Mr. Knowles, 86 Broad St., New York; builders, M. Gibbons & Son.

Jefferson Ave., n s, 150′ e Bedford Ave., 6 three-st'y brick-and-brown-stone dwells., tin or gravel roofs; cost, each, $6,000; owner and architect, H. E. Wells, 619 Carlton Ave.; builders, J. E. Brown and H. E. Wells.

Fifty-third St., s s, 210′ e Third Ave., 2 two-st'y frame dwells., tin roofs; cost, each, $3,000; owner and contractor, C. C. Firth, 110 Nineteenth St.; builders, Firth & Van Pelt and C. C. Firth.

Spencer St., s w cor. Willoughby Ave., 2 three-st'y frame (brick-filled) tenements, gravel roofs; cost, each, $11,000; R. J. Owens, Myrtle Ave. and Spruce St.; architect, J. G. Glover; builder, T. Donnelly.

Linden St., e s, 175′ e Bushwick Ave., two-st'y and attic dwell., two-st'y addition, shingle roof; cost, $1,000; owner, Jennie M. Connor, 1071½ De Kalb Ave.; architect, E. E. Payne; builders, F. Brinsley and A. Hensinger.

Bushwick Ave., s w cor. Suydam St., 2 two-st'y frame (brick-filled) dwells., tin roofs; cost, total, $9,000; owners, Charles Vorgang and J. Rueger; architect, Th. Engelhardt; builder, J. Rueger.

Marcy Ave., s w cor. Middleton St., 4 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, $4,500; owner and contractor, Jacob Bossert, Heyward St., near Marcy Ave.; mason, J. Auer; architect, J. Platte.

Bedford Ave., e s, 50′ s Putnam Ave., 2 four-st'y brick stores and flats, tin roofs; cost, each, $8,500; owner, T. J. Washburn, 708 Bedford Ave.; architect and contractor, W. H. Burhaus; mason, E. T. Otis.

Margaretta St., s s, 180′ w Bushwick Ave., three-st'y brick tenement, three-st'y addition, gravel roof; cost, $4,500; owner, F. J. Ledoux, 36 Margaretta St.; builder, I. D. Mason.

Hancock St., s s, 60′ w Nostrand Ave., 2 three-st'y brown-stone dwells.; cost, $9,500; owner and builder, S. E. C. Russell, 58 Hancock St.; architect, I. D. Reynolds.

Montague St., n s, 135′ e Hicks St., six-st'y brick store and flat, tin roof; cost, $15,000; owner, Henry Weil, Mansion House; architects, Parfitt Bros.

Hancock St., n s, 100′ e Reid Ave., 4 two-st'y dwells., tin roofs; cost, $6,500; owner, Kate Acor, 197 Bainbridge St.; architect, J. D. Hall: builder, L. Acor.

Ditmars St., s s, 200′ e Broadway, 4 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,500; owner and builder, Frederick Herr, 784 Broadway; architect, Th. Engelhardt.

Central Ave., e s, 25′ s Harman St., three-st'y frame (brick-filled) tenements, tin roof; cost, $4,200; owner, architect and builder, Ernest Loerch, 61 Himrod St.

Eighth St., s s, 307′ 10″ e Sixth Ave., 3 two-st'y dwells., tin roofs; cost, each, $5,000; owner, I. Brown, 381 Eleventh St.; architect, I. D. Reynolds; builder, W. Brown.

Twelfth St., n s, 119′ w Seventh Ave., 6 three-st'y brick and stone tenements, tin roofs; cost, each, $6,000; owner and contractor, Sampson B. Oulton, 188 Thirteenth St.; architect, W. M. Calder; mason, J. Wyett.

Chicago.

BUILDING PERMITS.—C. E. Brown, 6 three-st'y stores and dwells., 3611-3621 Cottage Grove Ave.; cost, $30,000.

W. Hynck, two-st'y dwell., 3514 Forest Ave.; cost, $2,500.

R. S. Critchell, 2 three-st'y stores and dwells., 3145 and 3147 Cottage Grove Ave.; cost, $7,000.

P. Amick, four-st'y factory, 58-60 West Van Buren St.; cost, $15,000.

L. Weil, three-st'y store and dwell., 214 State St.; cost, $7,000.

F. E. Dwartk, 2 two-st'y dwells., 1149 and 1151 Genesee St.; cost, $5,000; architect, C. M. Palmer.

B. Callahan, two-st'y store and hall, 3032 and 3034 Indiana Ave.; cost, $10,000.

W. R. Thompson, three-st'y store and flats, 1235-1241 West Jackson St.; cost, $11,000.

J. Witons, two-st'y store and dwell., 867 Thirty-first St.; cost, $5,400.

J. Gilbert, three-st'y store and dwell., 991 West Madison St.; cost, $11,000.

J. L. Campbell, 6 two-st'y dwells., 799-809 Warren Ave.; cost; $30,000.

H. R. Wilson, 4 two-st'y dwells., 3205-3211 Rhodes Ave.; cost, $12,000; architect, H. R. Wilson.

F. M. Lynch, two-st'y store and dwell., 609 Thirty-first St.; cost, $3,000.

G. Prince, 2 two-st'y flats, 879 and 881 Erie St.; cost, $3,000.

T. Rodick, two-st'y flats, 136 Wright St.; cost, $3,500.

Blake, Shaw & Page, one-st'y addition, 195 and 196 Clark St.; cost, $3,000; architects, J. M. Van Osdel & Co.

G. L. McCurdy, two-st'y dwell., 3647 Prairie Ave.; cost, $4,000.

G. M. Millard, 2 two-st'y dwells., 3716 and 3718 Johnson Pl.; cost, $5,000,

Phœnix Distilling Co., three-st'y addition, 96-104 Clybourne Pl.; cost, $3,000.

A. Mody, three-st'y dwell., 480 Jefferson St.; cost, $4,800.

J. Henby, three-st'y store and dwell., 589 Centre Ave.; cost, $8,000.

J. Stara, three-st'y dwell., 462 Jefferson St.; cost, $4,800.

Mrs. C. McCaffery, three-st'y dwell., 165 Maxwell St.; cost, $6,300.

F. Mikato, three-st'y store and flats, 416 Eighteenth St.; cost, $6,200.

J. L. Campbell, 6 two-st'y dwells., 780-786 Warren Ave.; cost, $25,000; architect, C. A. Weary.

A. Sheffen, two-st'y flats, 293 Dayton St.; cost, $2,500.

Huckins & Wood, 2 two-st'y dwells., 989-993 Congress St.; cost, $7,000.

W. Gruby, three-st'y flats, 295 Chicago Ave.; cost, $10,000; architect, F. Baumann.

Cincinnati.

BUILDING PERMITS. — S. Rosenthal, three-st'y brick dwell., 150 Linn St.; cost, $4,000.

Louis Seller, two-st'y brick dwell., Harrison Ave. and Queen City St.; cost, $2,000.

Mrs. L. Shallers, one-st'y frame dwell., State St., near Baltimore Pike; cost, $4,200.

Casper Stier, stable and machine-room, Fifth Ave. and James St.; cost, $3,500.

A. C. Landen, three-st'y brick dwell., Warsaw Pike and Wells St.; cost, $1,500.

Emile Rothe, two-st'y brick building, Brown St.; cost, $3,000.

A. J. Mullane, repair three-st'y brick building, Fourth and Plum Sts.; cost, $2,500.

Total to date, $252,536.

Kansas City, Mo.

BUILDING PERMITS. — W. B. Teasdale, brick house, Lydia Ave.; cost, $5,000.

John McQueeny, business block, Fourth St. and Grand Ave.; cost, $5,000.

Pacific Express Company, one-st'y addition to the Union Depot; cost, $5,000.

Mrs. Hurt, business block, 408 Main St.; cost, $5,000.

P. J. Fogarty, brick business block, cor. Eighth and Delaware Sts.; cost, $7,000.

Hayes Bros., frame block of ten houses, cor. Lydia and Grove Sts.; cost, $15,000.

C. A. Brockett, brick business block, cor. Eighth and Delaware Sts.; cost, $4,000.

H. M. Smith, Jr., frame dwell., Twenty-fifth St. and Brooklyn Ave.; cost, $5,000.

W. H. Daniels, frame house on Gillis Farm, cost, $5,000.

Mary M. Smith, brick house, Broadway; cost, $6,000.

Kansas City Electric-Light Company, brick business house, Eighth and Santa Fe Sts.; cost, $10,000.

Morrison Packing Company, brick business building, cor. Eighth and Hickory Sts.; cost, $3,600.

P. W. Ditsch, two-st'y brick and stone building; cost, $3,500.

Jas. Laird, two-st'y wooden building, stone front; cost, $7,500.

Temple & Fillmore, two-st'y wooden building, stone front; cost, $3,400.

New York.

ART MUSEUM. — The Park Commissioners have received bids for the enlarging of the Metropolitan Art Museum. This work is undertaken in obedience to an act of the Legislature, requiring that the sum of $162,500 a year be raised by taxation for two successive years, to be expended in building an addition to the museum. Bids were invited for the necessary excavation and the building of the foundation, granite and brick walls and roof. A second contract, for the interior construction and finishing, will be undertaken next year. Seven bids were opened yesterday. The highest was for $195,280, and the lowest, that of Jeremiah C. Lyons, was for $137,760. Action was deferred.

CHURCH.— The corner-stone of the German Lutheran Church of Immanuel, cor. Lexington Ave. and Eighty-eighth St., was laid October 31.

BUILDING PERMITS. — *Twenty-first St.*, s e cor. Thirteenth Ave., one-st'y lumber auction room, built of stone, and corrugated iron flat gravel roof; cost, $8,000; lessee, L. E. Jones, 1187 Madison Ave.; architect, C. Abbott French, 200 West Fifty-eighth St.

Lexington Ave., s w cor. One Hundred and Twen-

tieth St., four-st'y brick tenement, brown-stone front, flat tin roof; cost, $15,000; owner, John Bannon, 1884 Lexington Ave.; architect, John C. Burne, 1631 Third Ave.

Lexington Ave., w s, 20' s One Hundred and Twentieth St., 4 four-st'y brick tenements, brown-stone fronts, flat tin roofs; cost, $40,000; owner, John Bannon, 1884 Lexington Ave.; architect, John C. Burne, 1631 Third Ave.

East Forty-eighth St., *No.* 326, one-st'y brick blacksmith shop, flat tin roof; cost, $3,000; owner, Frederick Schumacher, 326 East Forty-eighth St.; architect, C. H. Dalhauser, 846 First Ave.

Willet St., *No.* 63, five-st'y and basement brick tenement, brick and brown-stone front, flat tin roof; cost, $19,500; owner, Fay & Stacom, 416 East One Hundred and Twentieth St.; architects, A. B. Ogden & Son, 409 East Fifty-third St.

East Twenty-fifth St., *No.* 225, five-st'y brick tenement; cost, $22,000; owners, Wallace & Smith, 148 East Fifty-second St.; architect, Oswald Wirz, 408 East Sixty-fifth St.

Mulberry St., *No.* 248, five-st'y and basement brick building, flat metal roof; cost, $6,000; owner, John McKean, 179 East Eleventh St.; architect, John B. Snook, 12 Chamber St.

First Ave., s e cor. Ninety-eighth St., two-st'y brick office-building, flat tin roof; cost, $4,500; owners, G. L. Schuyler & Co., 133 East Sixtieth St.; architect, James E. Ware, 239 Broadway.

Ninety-eighth St., s s, bet. First Ave. and East River, two-st'y brick stable, flat tin roof; cost, $4,000; owner, G. C. Schuyler, 133 East Sixtieth St.; architect, James E. Ware, 239 Broadway.

Avenue A, s w cor. Seventy-fifth St., five-st'y brick factory, flat tin roof; cost, $20,000; owner, F. W. Mertens, 134 East Seventy-sixth St.; architects, Schwarzmann & Buchman, Tribune Building.

East Eighty-first St., *No.* 218, five-st'y brick tenement, flat tin roof; cost, $17,000; owner, Chas. Gunther, 213 East Fifty-fourth St.; architect, R. Rosenstock, 535 Broadway.

Avenue A, w s, 25' s Seventy-fifth St., five-st'y brick tenements, flat tin roofs; cost, $51,000; owner, F. W. Mertens, 134 East Seventy-sixth St.; architects, Schwarzman & Buchman, Tribune Building.

ALTERATIONS. — *East Tenth St.*, *No.* 257, four-st'y brick store and dwell., peak roof, addition, flat tin roof; cost, $5,000; owner, Maria Wagner, 257 East Tenth St.; architects, Berger & Baylies, 52 Bible House.

Broadway, s w cor. Eleventh St., six-st'y brick hotel, internal alterations; cost, $3,000; owner, James Renwick, 28 University Pl.; masons, James Beggs & Co., 15 Cortland St.

Second Ave., *No.* 1054, three-st'y and basement dwell., flat tin roof, internal alterations; cost, $3,000; owner, Claus Von Kampen, 432 Hudson St.; architect, Leonard Sibley, 94 Vandam St.

Philadelphia.

BUILDING PERMITS.—*Orianna St.*, s Huntingdon St., 16 two-st'y dwells.; Eldredge & Stewart, contractors.

Almond St., n Clearfield St., 3 two-st'y dwells.; J. R. Pyle, owner.

Fairhill St., cor. Amherst St., 2 three-st'y dwells.; Jno. Scherber, contractor.

Hurst St., s Lombard St., three-st'y dwell.; Dutton & Bro., contractors.

Thomas St., cor. York St., 4 three-st'y dwells.; Thos. Twibill, owner.

Third St., cor. Lehigh Ave., two-st'y factory, 102' x 250'; Hoyle, Harrison & Raye, owners.

Second St., s Christian St., 2 two-st'y dwells.; Steinmetz & Boone, contractors.

Thompson St., w Thirtieth St., three-st'y ice-house; Harbach & Austin, contractors.

Twenty-second St., cor. Oakford St., 2 two-st'y dwells.; M. Kennedy, owner.

Clifton St., n Alleghany Ave., 11 two-st'y dwells.; M. McManus, owner.

Grant St., w Ninth St., 6 two-st'y dwells.; M. McManus, owner.

Saunders Ave., n Filbert St., two-st'y dwell.; Geo. F. Payne & Co., contractors.

Ridge Ave., w Leiper St., 2 two-st'y dwells.; Wilson Milner, contractor.

Broad St., s Ellsworth St., 3 two-st'y stores; Jno. Gibson, contractor.

Queen Lane, w Main St., addition to church; T. M. Davis.

Waterloo St., n York St., two-st'y dwell.; A. Asworth, owner.

South Sixth St., *No.* 1903, two-st'y store, Wm. Smith, contractor.

Germantown Road, above Huntingdon St., two-st'y store; F. A. Colamer, owner.

Germantown Road, above Huntingdon St., 2 two-st'y stores; D. M. Colamer, owner.

Rugan St., n Callowhill St., three-st'y ice-house; Geo. Eslinger, owner.

York St., w Sixteenth St., 2 two-st'y dwells.; Thos. P. Twibill, owner.

Thomas St., cor. York St., 7 two-st'y dwells.; Thos. B. Twibill, owner.

Penn St., n Harrison St., two-st'y dwell.; Taylor & Roberts, contractors.

Front St., n Huntingdon St., three-st'y dwell.; Jno. Loughran, owner.

Hope St., n Huntingdon St., 2 two-st'y dwells; Jno. Loughran, owner.

Belgrade St., n Wellington St., 2 two-st'y dwells.; J. C. Rorke, contractor.

St. Louis.

BUILDING PERMITS. — Forty permits have been issued since our last report, five of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:

Isaac Cook, two-st'y brick stable; cost, $4,700; architect, John Beattie; contractors, Kerr & Allen.

Jos. Flannery, two-st'y brick dwell.; cost, $4,000; contractors, Jos. Flannery & Bros.

Jos. Harbcka, 2 adjacent two-st'y brick dwells.; cost, $2,600; contractor, A. Vosse.

H. Schuck, two-st'y brick tenement; cost, $3,000; architect, Aug. Beinke; contractors, Herkoniffer & Bros.

Jos. T. Baier, 2 adjacent two-st'y brick tenements; cost, $4,000; architect, Wm. Popp; contractor, A. Vosse.

Mary W. Wiggins, repairing dwell.; cost, $4,000; contractor, J. W. Givens.

J. Robson, two-st'y brick dwell.; cost, $3,440; contractor, W. Whitting.

Mrs. Mary E. McGinnis, 2 adjacent two-st'y brick dwells.; cost, $3,000; architect, J. B. Lindsley; contractor, Gus Koch.

J. S. Thomas, 2 adjacent two-st'y brick tenements; cost, $3,000; contractor, J. S. Thomas.

Wm. A. Rutter, two-st'y brick dwell.; cost, $3,200; architect, Aug. Beinke; contractor, Jos. J. Wharton.

S. Obert, two-st'y brick dwell.; cost, $6,000; architect, H. Pelpers; contractor, George Boettinger.

Mrs. A. Brady, two-st'y brick dwell.; cost, $3,000; contractor, T. Argast.

N. J. Steben, two-st'y brick stable; cost, $3,000; contract sub-let.

H. Gaus, Jr., 2 adjacent two-st'y brick dwells.; cost, $5,500; contractors, Paulus & Weidemuller.

St. Paul, Minn.

COURT-HOUSE. — The corner-stone of the Ramsey County Court-House was laid October 13.

WAREHOUSE.—Workmen are now engaged in excavating and cutting away the bluff on upper Third Street, just above St. Peter, to the west of the St. Paul Roller Mills. This property is owned by E. F. Drake, and it is the general opinion that it is his intention to erect an immense freight warehouse and elevator.

BUILDING PERMITS. — Three-st'y brick store and dwell., n s East Seventh St., bet. Hoffman and Maria Aves.; cost, $12,000; owners, Lawrence & Weed.

Three-st'y brick stores and offices, e s Jackson St., bet. Eighth and Ninth Sts.; cost, $10,000; owner, Wm. Dawson.

Three-st'y brick veneered dwell., s s Tilton St.; bet. Rice and St. Peter St.; cost, $6,000; owner, M. W. Brown.

Two-st'y frame dwell., s s Como Ave., bet. Norton and —— ; cost, $4,000; owner, Wm. Hendricks.

Two-st'y frame dwell., n s Portland Ave., bet. Mackubin and Kent Sts.; cost, $5,000; owner, O. L. Taylor, 317 Jackson St.

Toledo.

THE SEASON. — The building season here is nearing its close, and quite a large number of mechanics and others are out of employment. The summary shows quite a large list of comparatively inexpensive buildings, and few of any special prominence.

ASYLUM. — The work on the asylum buildings has been vigorously pushed by the able and energetic contractors, M. J. Malone & Co., under the efficient supervision of Mr. Jas. Wiuans, C. E. Quite a number of the buildings are already enclosed, and work will not be slackened unless rigorous weather should render it necessary.

OFFICE BUILDING.— *Erie St.*, brick office-building for Dr. S. S. Lungren; cost, about $3,000; N. B. Bacon, architect; A. Bentley, builder.

STORE. — *Cherry St.*, brick business building for Dr. S. H. Bergen; cost, about $5,000; N. B. Bacon, architect; Vonfrecht & Nopper, builders.

THE GOVERNMENT BUILDINGS. — The new custom-house and post-office building is receiving the finishing touches to its roof, which promises to be a model in the way of fire-proofing and slating. The iron furrings in the interior, to receive the plaster cornices, are being put in place by Haugh, Ketcham & Co., Indianapolis, Ind.

HOUSES. — *Twelfth St.*, frame dwell. for W. W. Tryon; cost, $2,500; N. B. Bacon, architect; F. P. Blanchard, builder.

Collingwood Ave., frame dwell. for Jno. S. Kinnan; cost, about $12,000; E. O. Fallis & Co., architects; E. Fruend, builder.

Madison and Eighteenth Sts., frame dwell for Mr. Woodbury; cost, about $5,000; A. Liebold, architect.

Adams St., frame dwell. for A. Bentley; cost, about $4,000; N. B. Bacon, architect; A. Bentley, builder.

Jefferson St., frame dwell. for W. H. Keyser; cost, about $4,000; N. B. Bacon, architect; W. H. Keyser, builder.

Ashland Ave., frame dwell. for H. E. King; cost, about $2,300; N. B. Bacon, architect; R. Hattersley, builder.

Parkwood Ave., brick dwell. for S. B. Foster; cost, $10,000; N. B. Bacon, architect; H. J. Platfoot & Co., builders.

Twelfth St., frame dwell. for Dr. Chas. Cochran; cost, about $3,000; N. B. Bacon, architect; Vonfrecht & Nopper, builders.

General Notes.

BELLOWS FALLS, VT. — A number of years ago this town purchased the last remaining eligible site for a town-hall, but has never been able to get votes enough to warrant building. A recent special town meeting voted by a handsome majority to erect a building costing about $50,000, including rooms for an opera-house, post-office and public library. Arrangements for building are in the hands of a committee.

BROOKFIELD, MASS.—E. B. Gerald is building a block on Central St.

CATONSVILLE, MD. — F. N. Colston, Esq., is to have erected a three-st'y frame addition, 21' x 28', to cost $2,000, from plans by J. A. & W. T. Wilson, architects, Baltimore; H. A. Nagle, builder.

ELDORADO, KANS. — House for J. Fremont Thompson; cost, $4,000; Proudfoot & Bird, Wichita, Kans., architects.

EUREKA, KANS. — Congregational Academy; cost, $13,000; Proudfoot & Bird, Wichita, Kans., architects.

HOT SPRINGS, ARK. — Congress has appropriated $130,000 for an army and navy hospital at Hot Springs, Ark., but it appears that private parties have appropriated all the water of the medicinal springs, leaving none for the Government institution.

HURON, MINN. — Huron Odd Fellows have decided to build a $10,000 hall.

INDIANOLA, IO.—M. E. Church; cost, $12,000; Proudfoot & Bird, Wichita, Kans., architects.

JAMESTOWN, R. I. — Dr. David Kindleberger, U. S. Navy, will build a cottage upon his lot here; plans having been drawn by Mr. C. L. Bevins.

LENOX, MASS.—Mr. Robert C. Winthrop has recently sold to Mr. G. G. Haven, of New York, for $42,000, thirty-one acres of farm land. Mr. Haven is to build thereon a fine country seat.

LISBON.—MINN. — The Episcopal Society will build a stone church, 26' x 60'.

NEW BEDFORD, MASS.—Still another yarn mill, with $200,000 capital, will be built in this city, distinct from the New Bedford Manufacturing Company. Mr. Wood at Fall River will be treasurer, and W. J. Kent, agent.

NEW GARDEN, N. C.—The Friends' School are to erect a two-st'y brick boys' dormitory, 42' x 91', to cost $12,000, from designs by George Archer, architect, Baltimore.

NEWTON, KANS.—School-house; cost, $11,000.
Store-building for D. D. Puterbaugh; cost, $7,000.
Store-building for Lee Kimpinsky; cost, $5,000.
House for J. M. Ragsdale; cost, $10,000.
Tenement for Ragsdale Bros.; cost, $7,000.
House for S. D. Williams; cost, $2,500;
House for M. S. Stewart; cost, $2,000.
House for J. B. Dickey; cost, $3,000.
House for W. E. Chapman; cost, $3,000.
Presbyterian parsonage; cost, $3,000; Proudfoot & Bird, Wichita, Kans., architects for the above.

OTTUMWA, IOWA. — The G. A. R. of Ottumwa has $2,500 in the bank to apply towards the building of a soldiers' monument.

PARKVILLE, MO.—Rev. Dr. Thompson, Mr. Jonathan Ford and Mr. J. W. Byers of the committee from the Board of Trustees of Park College on the selection of a location for the new college building have selected a site on the high ground back of the building erected last year to take the place of the one burned. A building to cost between $40,000 and $50,000 will be erected as soon as possible.

PITTSBURGH, PA. — Those well informed on the subject predict the termination of the nailers' strike at the next meeting of the nail manufacturers, which will be held in Cincinnati on the 16th inst. The fact that the eastern manufacturers have advanced nailers' wages ten per cent is regarded as virtually ending the contest, which, however, is not for an advance here, but simply the restoration of the old price. The strike is now in its sixth month.

PROVIDENCE, R. I. — Rhode Island architects alone have the grateful privilege of competing for the building of three school-houses, on the understanding that the "right to reject any or all plans will be reserved."

ROCHESTER, N. Y.—Work has just been commenced on a new house on East Ave., for Hon. Geo. Raines; cost, $16,000; Chas. Ellis, architect; T. W. Tinucane, contractor.

Dwell., on Goodman St., for R. A. Sibley, Esq., to cost $5,000; Warner & Brockett, architects; J. B. Pike, contractor.

M. A. Culver, Esq., is about to erect a four-st'y brick block, cor. University Ave. and Culver Park; building to be 150' x 150', and to cost $20,000.

J. H. Murray, three-st'y brick and stone building; cost, $6,500.

SANDY HOOK, NEWTON, CONN. — Dr. W. C. Wile is pushing the erection of a large house and barn, has cellar built for house, 50' x 70'; cost, $10,000; Palliser, Palliser & Co., architects, New York.

SEEKONK, R. I. — In a few days a special town meeting is to be held, to see if the town will build a town-hall, the warrants being already printed.

SEWELL, N. J. —The corner-stone of a Baptist chapel has just been laid.

SPRING VALLEY, N. Y. — H. B. Hutchinson, Esq., of the Broadway Savings Institute, New York, is beginning to build a country house; Palliser, Palliser & Co., architects, New York.

ST. MARKS, KANS. — Catholic Church; cost, $3,000; Proudfoot & Bird, Wichita, Kans., architects.

VICKSBURG, TENN. — The colored people of Vicksburg have determined to erect a $50,000 monument to commemorate emancipation.

WATERBURY, CONN. — Rectory for St. John's Parish, stone and brick; cost, $16,000.
Double house for S. M. Buckingham; cost, $10,000.
Brick block for J. T. Phelan; cost, $8,000.
Factory for Smith & Griggs; cost, $5,000; Robert W. Hill, architect for the above.

WICHITA, KANS.—Two school-houses; cost, $23,000.
Presbyterian College; cost, $20,000.
Presbyterian Chapel; cost, $1,800.
Cottage for A. F. Rowe; cost, $2,000.
Cottage for Dr. Purdy; cost, $1,500; Proudfoot & Bird, architects for the above.

WILLMAR, MINN. — Willmar has voted $4,000 bonds for a new school-house, which, with $7,500 insurance on the old building, will enable them to erect a handsome edifice.

WEST HAVEN, CONN. — The corner-stone of the new Roman Catholic church at West Haven was laid November 8. The cost of the church will be $12,000.

WOODBURY, N. J. — The corner-stone of the new court-house was laid on Wednesday, October 28.

Poplar Ave., three-st'y frame dwell., 31' x 36'; Hazelhurst & Huckel, architects.

YELLOWSTONE NATIONAL PARK. — Secretary Lamar has given notice to a strong syndicate of Eastern and Western capitalists that upon their showing their plans of organization, and the outlines of the improvements they propose to make, he will grant them a new lease of hotel privileges in the Yellowstone National Park. The new syndicate comprises Sir Charles Gibson and John D. Perry of St. Louis; C. B. Wright and J. C. Bullett of Philadelphia; Frederick Billings, former president of the Northern Pacific; J. C. Casey of Minneapolis, and D. Carrington of Toledo. The plans have been drawn for six pretty and thoroughly convenient hotels, sufficiently large to accommodate the present and prospective tourist patronage of the park. These hotels will be erected at Mammoth Hot Springs, Norris Geyser Basin, Upper Geyser Basin, Grand Canyon, Tower Falls, and the Yellowstone Lake.

Government Buildings.

Augusta, Me., post-office, court-house, etc., site purchased. No work done.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 517.

NOVEMBER 21, 1885.

Entered at the Post-Office at Boston as second-class matter.

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A FEW weeks ago, a movement was made in the Boston Society of Architects to secure some sort of uniformity in professional charges among members of the Society for commissions upon works costing less than ten thousand dollars, and a schedule applicable to such cases was prepared, which seemed so satisfactory to the members that it was decided to make an effort to promote the adoption of a similar one by the profession in other places. Innocent as this movement appears to architects, the report of it seems to have alarmed at least one journal, the Utica *Herald*, which informs its readers that the Boston Society "has adopted a new scale of charges for buildings costing less than ten thousand dollars;" that "the rates are advanced," and that the "architects are trying to rally themselves to form a strong combination" "against the public," "to attempt to collect" "exorbitant rates," and so on; and it denounces the promoters of the movement as being "not the best friends of architecture," at least. It is fair to say that the Utica *Herald* is the only newspaper that we have come across which looks at the matter in this way, but there may be others, and we can do no less than hasten to disabuse the minds of those who share their opinions of the misconceptions which have led them into such singular errors.

THE worst of these misconceptions is the idea that the Boston Society of Architects advanced the customary rates in its new schedule. It is hardly necessary to say that something more is needed than the resolve of twenty or thirty gentlemen seated around a table to change the ordinary rates of remuneration for service in the profession to which they belong; and the Boston committee was not so foolish as to think of attempting such a thing; but, as all architects know, the inapplicability of the Institute schedule to small commissions has led to a diversity of practice in the profession in regard to work not covered by that schedule which has proved confusing to clients, and annoying in many ways to all parties. With the exception of the Utica *Herald*, we suppose that all persons in this country who know anything about architects understand that the standard five per cent commission on the cost does not nearly remunerate a professional man for the money and time which must be spent to do an architect's duty by a small house. Not only is the amount of time and study requisite for condensing the modern fashions and conveniences into a five thousand dollar house nearly, if not quite, as great as for designing one to cost ten thousand dollars, but as much time is necessary for superintending it, and the actual disbursements are often greater, for the reason that the small contractors whom it is frequently most advantageous for the owner of the more modest house to employ are less known and less accessible to the architect than the more responsible ones whom he would apply to in the case of a larger structure; and it is, according to our experience, usually necessary, in order to get for the would-be owner of a small house the greatest possible value for his money, to make two, three or more sets of tracings of all the plans, elevations and framing-drawings, and often five or six copies of the specifications, to be sent away to country carpenters and masons who cannot well leave their work and come to the architect's office to make up their estimates. All this extra labor must be paid for by the architect; and the outlay being returned to the owner ten or twenty-fold in the saving in the cost of his building, as is commonly the case, it is only reasonable that the architect should expect to be reimbursed. For all these reasons it has been customary, for at least fifty years past, to pay for small work at a higher rate of commission than would be charged for buildings of greater size and importance. So far back as the days of Andrew Jackson Downing, one of the first American architects to be employed on country houses, this practice seems to have been universally recognized; and the allusions which he makes to it in one or two of his books indicate that the charges usual in his time were not very different from those of the present day. Whether the architects of that generation had any fixed scale in such matters is not quite clear, but we should judge from the evidence that they had not, and the habit of leaving such charges to be made arbitrarily has now become a serious annoyance to those who have much small dwelling-house work to do, and like to do it well. As a partial remedy for the confusion, many of the New York and Boston architects, and we presume also those of other places, have had for years printed schedules of their own charges, covering all cases, upon which their negotiations with their clients can be based without fear of subsequent misunderstanding. Most of these, so far as our knowledge extends, follow, in regard to buildings costing less than ten thousand dollars, substantially the same scale as that embodied in the schedule drawn up by the Boston committee, although with slight variations in different cases; and the Boston committee seems simply to have carried out the excellent idea of collecting as many as possible of these individual tariffs, and reducing them to uniformity. As so reduced, the committee's schedule will be very serviceable, not only to those who have hitherto used individual schedules, as a substitute for their own, but to the still larger class of those who have depended upon their charges on a general idea of the fair rates, without the assistance of a fixed scale; and we can see no reason why, like the time-honored five per cent rule, it should not be really as serviceable to the public as to the profession.

A SINGULAR building operation is now in progress in Boston, where the old Masonic Temple, recently occupied by the United States Court, is in process of being replaced by a modern dry-goods store. The structure stands at the corner of two of the principal streets, one of which, after the usual Boston fashion, had been widened through its whole length except at the corner in question, where, either on account of the ownership of the land by the United States, or by reason of the cost of altering the old building, the city authorities had been unable or unwilling to change the original line. As the building thus projected three or four feet into the street, constituting a disagreeable obstruction, the new owners, who bought the property from the United States, reflected that if they were themselves to demolish the old Temple, which was perfectly useless to them, the city government, seeing the land cleared, would probably seize the opportunity, while there was no building on it, to condemn enough of it to complete the widening of the street. Although they would of course be compensated for the land taken, the reduction in the size of the intended store would be a serious detriment to their business, while the very widening of the street would deprive them of the benefit of that advertising which a store prominent enough to block the way in a crowded thoroughfare always gets; and they resolved to manage their building operations in such a way that there should be constantly on the land a structure so large and costly that the city authorities would hesitate before incurring the expense of demolishing it. With this idea the work was begun by piercing the walls of the old Temple near the ground, and inserting needles, with shores outside and inside sufficient to take the whole weight of the superstructure; and removing the foundations, to replace them by the foundations for the new building. As these approached

the sidewalk level, it became necessary to commence the second and more hazardous portion of the undertaking, which consisted in raising the Temple about fifteen feet, so as to allow the work of the new building to be carried on under it. Boston is somewhat noted for the skill of its building-movers, and although the old Temple was by no means a credit, in point of construction, to the Masons who built it, having walls of rather incoherent rubble, faced with the "saw-tooth work" which pleased the unscientific fancy of our grandfathers, the contractor in this case contrived, by putting timbers across the windows, and tying them together, to convert the shell of the building into a reasonably rigid box, under which were placed three hundred jack-screws, resting on the piles of timbers which by this time had replaced the shores. The work of lifting was then entrusted to six men, whose duty it was to go steadily around the building, giving each screw, as they reached it, a quarter-turn. When the screws had been turned to their full length, about fourteen inches, more timbers were inserted, and the screws were reset for another lift. So far, the work has gone on with perfect success, and by the time the old Temple has ceased to be of service in protecting its owners against the economical city authorities, the new building will be far enough advanced to take its place.

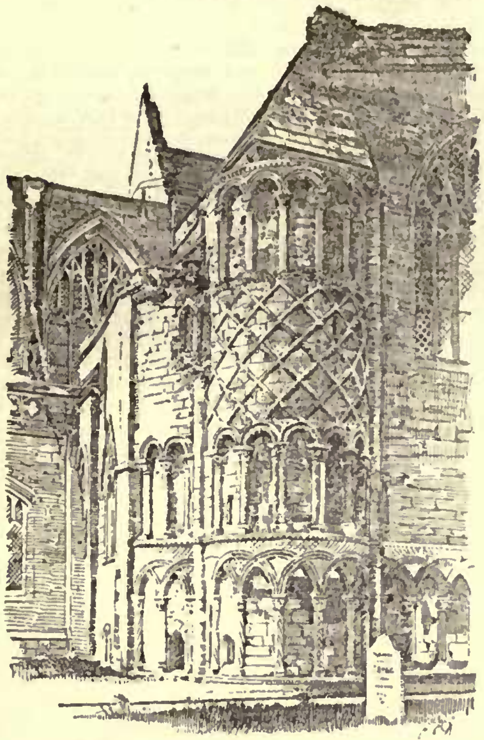
OUR readers will remember the "competition for historical painting" held a few years ago by the Philadelphia Academy of Fine Arts, in which a prize of three thousand dollars was, as most people understood the announcement, offered for the best picture of a historical subject submitted to the judgment of an expert jury on a certain day, two other inferior prizes being also promised for works of inferior merit. The competition excited much interest all over the country, as being ostensibly an effort on the part of the Academy officials and other distinguished citizens to "raise the standard of American historical painting," and, although the more experienced painters of the country, who have learned something of the character of these Grecian gifts which it is so much the fashion to parade around the artistic camp, gave themselves no trouble about the matter, a considerable number of others sent their best work to the exhibition. The jury of experts met, and, after a suitable interval, it was announced that "none of the pictures merited the award of the first prize," but the lowest prize was awarded to Mr. William T. Trego, apparently as a gracious mark of the beneficence of the Academy and its jury. Mr. Trego, who had imagined himself to be a party to a contract with honorable men, and not a supplicant for such clemency as those who had induced him to enter the competition might condescend to show him, demanded the first prize, on the simple ground that this was promised to the author of the best picture submitted, and that his picture, by the declaration of the jury and the vote of the Academy authorities, was the best one submitted. To the ordinary mind there appears to be no defence to this claim, but the Academy authorities resisted it, and he was unfortunate enough to take his case to the courts. Now, as we have often warned our readers, any man who seeks to get fair payment for honest work is reasonably sure to succeed by appealing to the law; but a professional man, whether artist or architect, who spends his time and skill in doing work for nothing, or for the chance of success in a scramble after prizes of any kind, is a being which the legal mind conceives with difficulty, and regards with a loathing which can only be appeased by subjecting persons of this kind who happen to come within reach to all those humiliations with which courts know how to discourage dangerous eccentricity. In Mr. Trego the Pennsylvania lawyers found an easy victim, and after something like two years of litigation he was disposed of by the decree of the court that "the whole matter of prizes was within the discretion of the jury, and they were not bound to give the first prize for a picture which they thought only reached the standard of merit intended to be covered by a third prize."

IT is easy to see, in the decision of the court, the influence of the notion which is so deeply implanted in the legal mind, that no transaction between human beings is conceivable except one of purchase and sale. In the imagination of the court the real intention of the Academy must have been to buy a picture worth three thousand dollars — this being the only legitimate exercise of any rational person's intellect. Through the natural feebleness of their apprehension, aided, perhaps, by a slight obscurity in the Academy's advertisement, a number of those strange lunatics who spend their time in smearing valuable canvas with paints mistook the simple expression of the Academy's desire for an indication of some sort of preposterous scheme for encouraging their deplorable business; and were so far misled as to prepare and bring a number of their wretched works to the Academy authorities. The latter, finding none which they considered worth three thousand dollars, picked out one for which they were willing to pay one thousand, and offered this sum to the author, who was dissatisfied with it, and tried to make the court help him to get more. It is unnecessary to say that the court felt bound to refuse this request, and probably congratulates itself to this day on having so successfully defended the noble principle of *nudum pactum nullum pactum* against the complaints of unpractical daubers. Perhaps the Academy is to be congratulated, also, on having got off so cheaply with the profits of its ingenious scheme for attracting the public to its exhibition; but we trust that the artistic world in general, in which we need not, perhaps, include the Philadelphia Academy or the members of its expert jury, will note the uses to which twaddle about the "encouragement of historical painting," and so on, may be put by those who use it with truly business-like intention.

MR. C. J. HEXAMER writes to the *Fireman's Journal* some letters on spontaneous combustion, which help to show the correctness of the opinion common among underwriters, that spontaneous combustion is a more common cause of fires than most persons imagine. After discussing the causes of spontaneous combustion in coal, Mr. Hexamer goes on to speak of the explosive combinations of chemicals which are sometimes made up by druggists in the course of their business. It would seem from the account that physicians, who certainly ought to know better, sometimes forget the chemical properties of the drugs which they prescribe, in their anxiety to secure the medicinal qualities which they wish for, and prescribe mixtures of a dangerously combustible character. The highly-oxidized substances, such as chlorate of potash, permanganate of potash, chromic acid, or bichromate of potash, and nitrates of the metals, and those metallic oxides which part very readily with their oxygen, such as oxide of silver, when mixed with organic or carbonaceous matter; and iodine or chlorine, either by themselves or in combination, when mixed with ammonia, are apt to form very explosive compounds. Most persons who have dabbled in chemistry have tried the experiment of putting iodine in strong ammonia, and allowing the black substance which is formed to dry on a piece of paper. As soon as it is fairly dry it explodes with a violent report, and even while moist, a sudden jar, such as that produced by the shutting of a door near by, will generally set it off. This substance, according to Mr. Hexamer, is formed when tincture of iodine and ammonia are mixed, as is not unfrequently done by physicians' orders; and if it were not that water is usually present in the mixture, explosions would often take place. The chlorates and nitrates are perhaps most apt to cause accidents, particularly when mixed with glycerine, tannin or sugar. There is a little chemical experiment, which consists in mixing chlorate of potash and sugar together, filling a thimble with the mixture, and allowing a drop of sulphuric acid to fall into it, when the compound instantly takes fire and burns like so much gunpowder; and lozenges or other preparations of chlorate of potash and sugar or glycerine have repeatedly exploded in the pockets of their owners, and even in the mouth, on coming in contact with particles of carbonaceous tooth-powders. Chromic acid is a still more unstable substance, and a mixture of so small a quantity as eight grains of chromic acid, dissolved in water, with one drachm of glycerine, which was compounded from a physician's prescription, once exploded in the hands of the pharmacist who was preparing it; and a box of pills containing oxide of silver and muriate of morphia recently exploded while the lady for whom they were prepared was carrying them home, burning her severely. Although physicians' prescriptions usually deal with quantities of drugs too small to occasion serious accidents, the spontaneous ignition of a box of pills may easily set fire to neighboring combustible matter; and the terrible explosion which took place in the cellar of a drug-store in Boston ten years ago, completely destroying the building and every person in it, shows that great care should be exercised in allowing uninstructed persons to meddle with mixtures of chemicals, even if harmless in themselves.

NOTES FROM ENGLAND.[1]—II.

BOURNEMOUTH—CHRISTCHURCH.



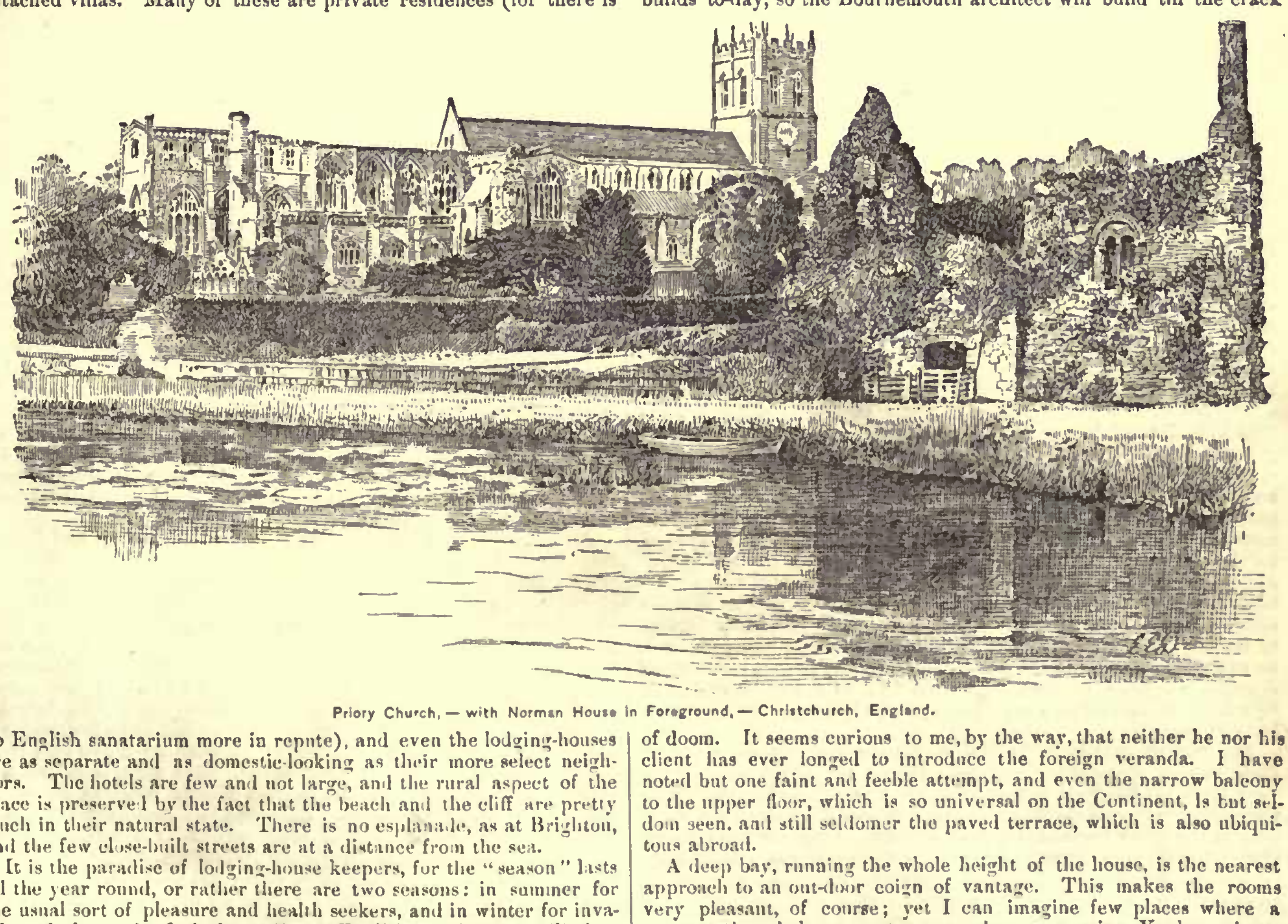
Norman Turret, Priory Church, Christchurch, England.

A SOUTH-OF-ENGLAND watering-place is by no means a bad spot in which to spend an autumn month; and if a summer of hard travel has given an appetite for rest, one could scarcely do better than seek it at Bournemouth. The Hampshire coast has not the romantic charm of Devon, but it is much more accessible, and is at least more attractive than the stretches still farther east. At Bournemouth a low cliff edges the beach, and the shore runs out right and left into the horns of a broad bay, broken on the right by the island-dotted entrance of Poole Harbor, and pointing on the left toward the far-off white needles of the Isle of Wight. The bathing is perfect, and there are all the usual resources of a large watering-place: pier and public gardens, excursions by water, reading-room and clubs, excellent shops, music and Punch-and-Judy join in their allurements. Yet it is not a large watering-place of the citified Brighton or of the excursionist Ramsgate type. It is never visited by troops of casual cockneys, and it is not a close-built town, but (with the exception of two or three streets) a huge agglomerate of detached villas. Many of these are private residences (for there is no English sanatarium more in repute), and even the lodging-houses are as separate and as domestic-looking as their more select neighbors. The hotels are few and not large, and the rural aspect of the place is preserved by the fact that the beach and the cliff are pretty much in their natural state. There is no esplanade, as at Brighton, and the few close-built streets are at a distance from the sea.

It is the paradise of lodging-house keepers, for the "season" lasts all the year round, or rather there are two seasons: in summer for the usual sort of pleasure and health seekers, and in winter for invalids and those who find the ordinary English weather an affliction. The place was made by and for its winter population, indeed, and the summer season has been an aftergrowth. It has a climate even milder than that of the Isle of Wight, and a very sheltered position, and right up to the edge of the cliff it is covered with a health-breathing forest of pines. And these pine-woods are its great attraction to the eye, as well as its great gift to the delicate lung. The public gardens occupy a long, narrow valley, with steep wooded slopes crowned with villas,— an extremely pretty perspective. And above, on either hand, the villas stretch for miles, set deep in the shadow of the evergreen foliage. A hundred yards from the edge of the cliff the sea has almost disappeared from memory; one might imagine himself in the bosom of some German hill country.

Bournemouth, even as a winter resort, is the creation of the last twenty years. Sir Henry Taylor, who still lives here in octogenarian repose, says in his "*Autobiography*" that when he built his house, in 1865, the residents included "two clergymen, two widows and four old maids." It has now a population of sixteen thousand eight hundred and fifty-nine, but the enormous growth is wholly a watering-place growth. The "upper class" and the tradesmen who minister to its needs make up the entire list. Even day-laborers come to their work from the villages round about. It seems curious to be in the Old World and yet in a town as rootless as any in the New, with absolutely no "associations" save those which cluster round the home of the Shelleys, a few miles away, and the graves of Mrs. Shelley and the Godwins, in the beautiful church-yard in the centre of Bournemouth itself. As a compensation, one has an unrivalled opportunity for studying the domestic architecture of the last few years. Truth dictates the comment, however, that it is not much of a compensation after all. Of course one looks for no great English homes and for no ambitious "cottages" such as we find in our differently-constituted watering-places at home; but amid a myriad villas, which have been built, too, under the most favorable natural conditions, one does hope for an occasional glimpse of simple beauty. I have hoped and looked, but found little to reward me. Abstract the beautiful pine-groves and the charitable ivy, and I think Bournemouth would show a very ugly and a very unintelligent face. Of course where everything is of brick, the result must be better than where clapboards and the jig-saw have rioted together. But solidity and a conventional, rather stupid respectability are the best one can claim for Bournemouth houses. And when they try to be a trifle more unconventional, the novelty is apt to be both awkward and fantastic. If they have any "points" at all, they are points one does not prefer to unmitigated dulness. I have not seen a really pretty house, still less one with any claim to novelty in excellence. Sometimes, even beneath non-success, there is a vague promise of future improvement; but I fail to trace it here. It seems as though, as he builds to-day, so the Bournemouth architect will build till the crack of doom. It seems curious to me, by the way, that neither he nor his client has ever longed to introduce the foreign veranda. I have noted but one faint and feeble attempt, and even the narrow balcony to the upper floor, which is so universal on the Continent, is but seldom seen, and still seldomer the paved terrace, which is also ubiquitous abroad.

A deep bay, running the whole height of the house, is the nearest approach to an out-door coign of vantage. This makes the rooms very pleasant, of course; yet I can imagine few places where a greater than balcony or terrace, where a genuine Yankee piazza would be more desirable. One comes here to live out-doors, whether



Priory Church, — with Norman House in Foreground, — Christchurch, England.

[1] Continued from page 181, No. 512.

one comes here in summer or in winter, and the sole way to do it is to stroll beyond the limits of one's own domain. In truth, lover of out-doors though he be, the Englishman never *lives* outdoors, as do we on our piazzas, as do the Germans on their terraces and in their arbors. He takes his walks abroad, but he rests and does his work or play within the four walls of a room. Of course his climate may be named in explanation; but it sometimes gives him a summer of warm weather and absolutely unbroken sunshine, like this of '85. And even when it rains in England it rarely pours in hopeless, never-ending torrents, as with us. It rains either gently or briefly, and usually both gently and briefly, even when most frequently. It is just the climate, I should think, in which, though the terrace would often be useless, the semi-shelter of an American piazza would be a valuable help toward making life worth living. At all events I know it has been a disagreeable sensation, during a long month of lovely weather, always to be indoors when not, as the schoolmistress phrases it, "engaged in taking exercise."

A contrast of a sort more favorable to English customs is the entire absence of furnace-heating. Hotels and very large houses here are heated by steam (at least in the hallway), but all others have only the open fireplace. Yet as this is in every room, and in the hallway of every floor besides, it suffices amply. But in this matter, of course, the difference in climate is all-controlling.

Nor do the Bournemouth churches seem to me very interesting. In some the conventional design of the interior has been modified somewhat in a search for greater practical fitness to modern congregational needs; but so far as I have seen (I speak without having seen them all), the usual rows of columns are retained, though reduced to a minimum of bulk and frequency, and in no case is the result very satisfactory from an æsthetic point of view. The chief church of the town was built by Mr. Street, but, although its parts seem to me well grouped and its interior prettily decorated, it shows a curious eccentricity in the treatment of its features, both large and small. The desire has been, of course, to do something unhackneyed, but as the method employed is that of associating elements of several Gothic styles, without any attempt to bring them into concord, to fuse them together, as there is, in a word, no visible original *conception* underlying all parts and features, I think I am justified in using the word "eccentricity" instead of originality.

Some of the windows have fully developed geometric, while others have plate-tracery, which would not matter, of course, could one see the reason why, or find any harmony in the juxtaposition. Lancets are also freely used, which one can well understand in certain places. But it is puzzling to turn from the Decorated windows of the east end and south transept, and find in the north transept five graduated, very narrow lancets, each of which is cusped, and all of which are comprised under a hood-moulding that is returned square at the ends, like an Elizabethan label. I think even an eye which knew naught of historic precedents, would find such a composition inharmonious. Neither this nor any other similar essay I have seen convinces me that it is as well (for an Englishman, at all events) to try "free Gothic" as to be content with more "grammatical" practice. New *ideas* do not seem to appear, though there are plenty of new combinations of old ideas alien to one another. The mixture is mechanical, not chemical, and the most casual eye cannot help resolving it into discordant elements.

But if there is not much in Bournemouth itself to interest the architectural student, he could hardly have a better starting-point for brief excursions. Winchester and Salisbury are but two, Wells is but three hours distant. Corfe Castle may easily be managed in one day, as may Southampton and Netley Abbey. The villages near at hand often contain picturesque small churches (sometimes quite innocent of the restorer's hand). Wimborne Minster is only nine miles distant, Christchurch only five miles, and both may be reached by rail. The latter is a charming little town, beautifully situated at the confluence of two rivers just before they enter Christchurch Bay. The splendid old Priory Church stands just beyond the town, and gains an added beauty from the old churchyard on the edge of the river, with the loveliest panorama of pasture-land and stream beyond, and in the far distance the snowy cliffs of the Isle of Wight. And it gains much, also, in that its exterior has been comparatively little restored. It has been injured by time, as in the loss (to the eye) of its choir roof; but such undisturbed losses mean an historic purity such as modern England seldom permits in a church of this importance, and a vast increase of pictorial charm, especially as regards color. This is the great thing wanting — the color given by time — in England now, and one hails with double pleasure, therefore, such an exterior as we find in the priory church. The surface of the stone is really exquisite in tone, owing not only to the common yellow lichen, but to another of a more impalpable kind, which is of a deep but vivid red.

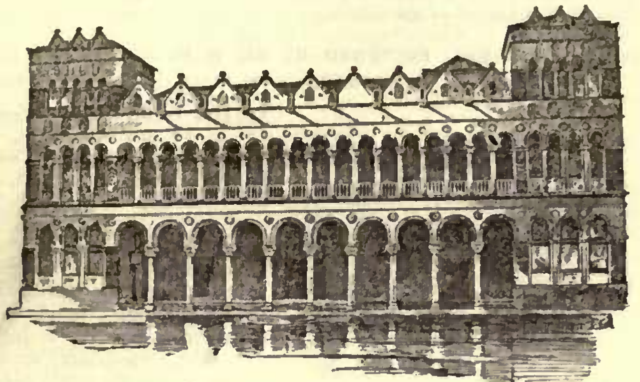
The church was built by Ralph Flambard (then the Prior of Christchurch, afterwards the famous Bishop of Durham) about the year 1100. It has been largely rebuilt, however, since his day. The nave walls were remodelled and their windows altered, and a vault built in the Early Decorated period, while the long choir and Lady-chapel and the west front and tower are Perpendicular. But many bits of Norman work survive on the exterior, chief among them an angle turret attached to the north-east corner of the north transept, which is of almost unique beauty, covered with rich arcadings and a bold, reticulated pattern in strong relief. The shafts of the lower intersecting arcade are ornamented with spiral or angular or reticulated flutings, and all the capitals show stronger Classic reminiscences than are the rule in English Romanesque. All have small volutes at the angles, and some a connecting garland with a rosette above, that speaks distinctly of a Roman prototype. The Norman portions which remain in the interior (the nave and north transept below the clerestory) are disproportionately plain and even rude in workmanship. The capitals seem to have been left in block throughout, and partially carved at a later date by an unskilful hand. It is impossible and would be tedious to note how curiously the work of many epochs is intermingled in this church: more naïvely than we are apt to see it, for example, in the great cathedral churches. It is an interesting study, and would be a doubly puzzling one had Mr. Paley not supplied the student with a concise but excellent guide, such a guide as one still calls for in vain in a great number of important English churches. But the puzzle, I repeat, has not been as much complicated as usual by modern restoration, and is therefore of a stimulating, not an exasperating kind. I will only note that each transept formerly ended in an apse. On the north this has been remodelled into a Decorated flat termination, though the angle turret still remains. On the south, Mr. Paley says, both yet exist; but the apse has been blocked off from the interior, and I could not see the exterior, as it is approached through a private garden. A marked discrepancy in elaboration (Mr. Paley adds) exists between the two ends, that on the south being quite plain, while on the north the apse seems to have been decorated in the same lavish way as the turret already described. He deduces the reason, with probability, from the fact that the north side of the church faced the castle, and the circumstance seems to me interesting, as throwing an anti-Ruskinian light upon the supposed habits of mediæval builders, who, we are told, unlike their Renaissance successors, were solely inspired by pious fervor, worked for the glory of God and not for the eye of man. and therefore as conscientiously and lavishly in hidden places as in the most conspicuous. I should add that both the turrets still keep their Norman stairs.

The Early Decorated detail in many parts of the church is extremely good — notably in the great north porch. There is also much charming Perpendicular decoration in various tombs and enclosed chantries. The finest of these last is believed to have been the work of Torregiano, and is a truly magnificent specimen of the transitional period — the main design being Perpendicular, but many of the details pure early Italian Renaissance in character. One does not too often see *early* Renaissance work in England, and it is interesting to note that the best example of similar transitional treatment (which is not a patchwork, but a thoroughly artistic blending of varied elements into an harmonious whole) that I can remember is also attributed to the Italian sculptor — Bishop West's chapel at the east end of the south choir-aisle at Ely. The reredos of the Lady-chapel is also a lovely piece of Perpendicular decoration, and the older stone altar beneath it is a survival seldom seen in the England of to-day. More remarkable still is the great reredos over the main altar, an Early Decorated work that was retained when the Perpendicular choir was built. It represents the stem of Jesse — a motive more commonly seen in stained glass than in sculpture. The figures are of large size, especially the sleeping figure of Jesse below. The branches supported niched statues, most of which have perished, but the central relief is entire. It shows the Adoration of the Magi in a very curious composition, the Virgin being in a recumbent attitude and holding the Infant upright on her knee. In its realistic naïveté as well as its rather rough execution, and especially in its feeling, the reredos reminds one strongly of German work of a somewhat later period. But both its date and its native origin are proved, I suppose, by the presence of the ball-flower among its details. The purely architectural interest of the later portions of the church is as great as the interest of its many sculptural and decorative accessories. The vault of the Lady-chapel, for example, could hardly be surpassed for beauty of shape and loveliness of rich groining in all the great magazine of varied vaulting which Perpendicular architects have left us. In fact, whether for architectural variety, for the chance to study the *modus operandi* of the ancient rebuilder and restorer, or for treasures of decorative sculpture, few of the second-class churches of England can offer attractions equal to this.

An admirable view of the north side of the church is had from a little stone bridge which crosses the Avon on the outskirts of the town. One sees it rising in its stately length beyond its shaded churchyard, while in the middle distance are the ruins of the Priory and of other crumbling, fern-clad walls. And the foreground is filled by a most interesting object — the remains of a Norman house which must once have adjoined the castle. Fortified buildings of the same age (Henry II) are, of course, not rare in England, and small street façades are seen occasionally, as in Southampton and in Lincoln. But a relic of just this character — an important, detached, and yet unfortified, house — is excessively rare. It is an ivy-grown ruin now, yet many of its features are unimpaired. One gable is entire, and also a tall, slender turret; and, besides plainer windows, there are two of very charming design. Each has two round-headed lights, divided by a slender shaft and comprised under a delicately-ornamented arch. In truth, nothing more interesting, nothing more picturesque and lovely, nothing more characteristically English in the very best sense of the word, can be imagined than this view from the bridge at Christchurch, with its intermingling of architectural and pictorial charm, its church, its ruins, its river, its pasture-lands, and beyond all, the white cliffs and the sea. M. G. van Rensselaer.

THE FONDACO DEI TURCHI.

VENETAIN ARCHITECTURE OF THE THIRTEENTH CENTURY.



Palace of Lucretia Borgia, Venice.

THE Fondaco dei Turchi was formerly one of the important palaces of the thirteenth century on the Grand Canal, Venice, and when twenty-five years ago it fell into the hands of the restorers it had the look of an imposing ruin, on looking upon which, regret for all that it had lost through the centuries, was softened by the sight of so much that remained of precious material, and still more precious work. The very decay conveyed the idea of the antiquity of the building, antiquity which expressed itself by the corrosion of the sculptures and the softest touches of amber color on the original polished surface of the marbles, each the work of Nature, produced by alternation of storm and sunshine, and which, being carried out in a natural way, led to a picturesque result.

The highest form of picturesqueness, if a definition may be permitted, is produced by the work of Nature on the work of man; above all is this true of architecture, from the greatest buildings which express the combined efforts of nation, race and age, to the house where man lives, down to the very garments which he wears, and which may he considered his movable dwelling-place, in this respect but little different from the snail or oyster shell, and though for the modern realistic painter there may be no limit to picturesqueness in the wearing out of clothes, there is a very strict one between what Nature does on a monument of architecture, placing upon it the mark of time as it rushes by, and what it does in order to roll it down with rocks and stones and trees, treating it as common matter.

To say it in few words, this picturesqueness is that work of Nature on a monument which does not destroy the monument. With such touches Nature had embellished the Fondaco dei Turchi for six hundred years, and looking upon it one could feel that it was old indeed; one could rest beside its arcades with a sense of calmness, conscious of its long continuance, as it stood there watching the rapid changes taking place all around — a superior organization, on which centuries and events had no hold.

After the Republic fell, the majority of the palaces in Venice were abandoned to decay. Seen from the outside they looked deserted, with broken panes of glass and loosely-hanging shutters. The Fondaco dei Turchi began then to cover itself with wild grasses, and its roof was allowed to collapse, the rainwater came in and began to spoil the walls, then the marble facings of the façade detached themselves, and fell down, leaving the brickwork exposed.

An old mason, who works now with me in the Ducal Palace, and who acted as foreman in the restoration of the Fondaco, saw, when he first entered it twenty-five years ago, in an upper room of the left tower, what he describes as a beautiful wide frieze of foliage of different hues; and he also saw projecting from the cornice of the first floor a cherry tree, which was rooted in the brickwork of a spandrel below it, and of which in the spring of 1861 he ate a few ripe cherries.

The neglect which the Fondaco had suffered for so many years, was followed as a natural consequence (of which Mr. Ruskin has discovered the law) by a great desire for restoring it in order to use it as a museum. No matter how much it had suffered from neglect and old age, it might have been possible to prevent further damage by keeping it as it was, much decayed, much torn-down in places, but precious as an original piece of architecture in every little bit that was left. But the municipality wanted to have it restored, and accordingly the old Fondaco was pulled down, down to its foundations, which were dug up in order to raise on their site the new building.

The Fondaco dei Turchi had been built about the year 1230, by Giacomo Palmieri, a Guelf consul of Pesaro, who found refuge in Venice, when his town fell into the power of the Ghibellines. The old chronicles say he was very wealthy, some say he was a Feudatario, and all agree in his having discovered huge treasures underground, among others a golden calf.

Palmieri was buried in the cloister of the Franciscan monks at the Frari, and the following inscription was engraved on his tomb, destroyed long ago: —

SEPOLTURA DOMINI PALMIERI

DE CA DA PESARO ET SUORUM HEREDUM.

His descendants were named after the place they came from, and so their house (*cà*, old Venetian for *casa* like *Cà d'oro*, meaning golden-house,) was known as Cà Pesaro.

Giacomo Palmieri had a son, named Angelo Pesaro, whose will is still preserved in our archives, its date being June XV, 1309, and in it he orders his descendants, his son Nicholaus first of all, not to sell the palace, prescribing that he "*nunquam possit, nec debeat vendere, alienare commutare vel impignorare*" the Cà Pesaro. But the Signoria bought it in the year 1381 for ten thousand ducats, and made a present of it to the Marquis of Ferrara, whose descendants in the seventeenth century sold it to Antonio Priuli; he was elected a doge in the year 1618, and let the palace to the Turkish merchants, who continued to rent it as a *fondaco* (storehouse) till the year 1838.

The doge Priuli left the Fondaco to his son Jerome whose daughter Mary, being married in the year 1648 to Ser Leonardo Pesaro, procurator of St. Mark's, brought back to her husband as a dowry the palace that his forefathers had built. His family kept it till the years 1830, when becoming extinct with Pietro Pesaro, it went to his nephew Count Manin; by him it was sold in the year 1838 to Mr. Antonio Petich, who let a portion of it as a magazine for the tobacco manufactory.

Saddo-Drisdi was the last Turk inhabiting the Fondaco: when in the year 1838, Mr. Petich bought the place, this Mahommedan parasite of an Arabo-Byzantine building refused to leave it, and when the head of the Austrian police went to persuade him to go, he pointed two pistols at him and nearly killed him; then he disappeared and nobody ever knew where he went.

The original brickwork of the Fondaco was made of *altinelle*, so-called from the Roman town *Altino* on the shore of the lagoon, which was destroyed by Attila. We know that the early buildings erected on the islands of the Venetian lagoons were either made of wood on reeds, or of materials taken from the destroyed cities on the Continent, such being the case with the marbles of Torcello; but so far as brickwork is concerned, the Venetian monuments of the ninth century, like the oldest part of St. Mark's, the basement of the tower and some relics of the ancient Ducal Palace, were all built with large Lombardic bricks, but finding them too costly, or being unable for some reason or other to provide new ones, they went again to fetch the old Roman bricks of Altino; their dimensions are 0.20 x 0.08 x 0.05 (the modern regular pattern is 0.26 x 0.13 x 0.06 metres).

The mortar used by the builders of the Fondaco dei Turchi, like that of the contemporary buildings in Venice, was made with lime derived from the white Istrian stone. The mortar, as is usually the case with bricks used for the second time, did not adhere to them, in some cases, so that traces of the old Roman plaster were found upon the *altinelle.* Every column had an iron bolt binding the capital to the shaft, and the stones were fixed with mortar.

The foundations of the Fondaco were either made of a masonry of irregular stones, laid in a hard mortar, apparently of *pozzolana*, or of layers of the same greenish sandstone from Trieste, called *muggia*, which constitutes the foundations of St. Marks.

The restoration was begun about the year 1860, and carried on so completely as to leave no hope of finding a relic, which may be confidently looked at as such, of the original palace. Whilst the place was being rebuilt, the subtile arrangement of proportion in the arches, which diminished gradually towards the towers, was unnoticed, and the whole façade was raised again with the greatest display of mechanical precision and geometrical symmetry.

The restorers did not stop to ask what was sufficient to the rebuilding of the palace, but they wished to improve the Byzantine carvings and the workmanship of the stone. Every shaft of the columns, shafts which had been worked at first for some Greek temple, and had then been brought to Venice by the old Venetian merchants, were worked over again in order to obtain a perfectly new cylindrical surface. The Corinthian capitals and the more capricious ones of Byzantine workmanship, broken and chipped perhaps, that is to say, having the end of one or more projecting leaves worn off by time, were carved again in order to get a new one inside of the old. The ancient sculptures representing drinking peacocks or fighting animals were completed by the restorers with additional features, and the whole work was "improved" with fresh touches of the chisel.

Spoiled as it has been, the Fondaco dei Turchi still retains much which arrests the attention. I mean certain general features, about which the doubt may arise what relation they bear to the original work, viz., the height at which the palace was rebuilt, the general distribution of its façade, and the materials that were used in it.

The Fondaco was rebuilt at the level of the old, that is to say, one and one-half feet lower down than the average level of modern Venice. In order to prevent high tides from invading the loggia on the ground floor, a platform has been raised three steps above the pavement, behind the columns. It is curious to notice how, whilst the restorers had all their whims and wished-for changes and improvements satisfied and carried out all over the place, they were so scrupulous about the level, and rebuilt the Fondaco almost under water, whilst it would just as well have answered their purpose to raise it one metre higher, marking on the corner-stones the old level.

Some other opportunity will present itself, I hope, to discuss what concerns the level of the old Venetian monuments, in connection with the gradual sinking of the Venetian estuary.

The professional man who looks at the restored façade of the Fondaco may be puzzled by the fact that the lateral towers and the crowning battlements do not appear in the photograph of the old palace. The existence of the towers is proved, however, by the wood-engraving of the year 1500, attributed to Albert Durer, and though

the restored ones are not to be looked upon as documentary, it is interesting to recollect how the early Venetian palaces must have looked like massive piles of bricks with strong towers at the corners, like our Ducal Palace of the ninth century, fit to resist the incursions of the Hungarians, *pagana et crudelissima gens*, and how they must have grown familiar in the minds of the Venetians, who two centuries later, when their town was growing rich and safe, when there were no more incursions and there was a great wish to embellish Venice, the main features of her primitive palaces were retained, and ornament was given by facing the brickwork with stones, or otherwise decorating it with sculptures or with discs of precious marbles, throwing the central wall open into series of arches sustained by columns brought from the Orient, and making the battlements more light and decorated.

The restored Fondaco is all faced with marble, but according to what my old mason recollects he found of the old battlements, he was led to believe that they were made of bricks surrounded by a moulded framework of marble. For myself I feel rather inclined to believe that the brickwork of the Fondaco was not entirely hidden by facing. The object of some proportion of brick surface would be that of affording a contrast of color and also of richness of material, so that by means of its confessed simplicity the richness of the other parts might be felt at once, while, as is the case now, if the facing with marble is carried out all over the whole building, it imports into it a wearisome look of sameness and of insipid richness.

We have noticed before how the shafts and capitals were cut and sculptured anew; in some cases the reduction in size was not considerable, but in every case a good scraper left the restorer sure that not an inch of the original surface of the marble would be left. The new surface was polished with pumice-stone, omitting the last burnish with lead, with the idea the marble would get back sooner the color of antiquity, but as we know that careless polishing is one of the first sources of the decay of marble, so it happened that in a few years the columns and facings of the Fondaco turned white. To remedy this the municipality of Venice allowed the Fondaco dei Turchi to be smeared with nut-oil, four years ago, which would for a time bring forth the utmost color of the marble. At the same time the Farsetti Palace, the residence of the municipality, also a Byzantine building, lately restored, had been smeared with the same oil, and they were proposing to paint with varnish the south front of St. Mark's, and dye it artificially with smoke. In order to prevent more stupid steps being taken, I wrote an article in one of our papers, suggesting how those poor marbles should be washed and then polished, in order to obtain their natural color, and as regards the smearing of the Fondaco dei Turchi, I added this: —

"Was it not sufficient to have taken away, by means of scrapers and sandstone, the color of centuries? Was it not enough to have touched with a sacrilegious chisel all the sculptures, annihilating in that wonderful Arabo-Byzantine monument every archæological, historical and artistic value, substituting often the vilest Carrara for the most precious Greek marble, and oppressing the whole building under rows of battlements whose origin is unknown? Was all this not sufficient, but was it needed to smear with bird-lime the marble that was left to us? They will be no longer trophies, but leave them to us as marbles, and time will give them partly the appearance of their former value, but if you turn them into snares for bats, dust and dirt will form a crust on their surface, and it will be a loathsome thing."

The day after, the oil was washed out with some alkali water, but its traces, like a disgusting leprosy, remained a long while on the marbles of the Palazzo Farsetti, which at last were cleaned and polished carefully last May.

The south front of St. Mark's has now been polished with lead; the best thing that could be done for those beautiful marbles already spoiled by the scraper. As regards the Fondaco dei Turchi, the same measure will be taken in order to save its marbles, which are precious and rare indeed.

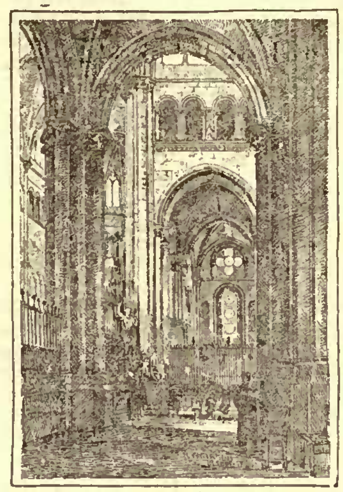
While looking back to the photograph of the old monument taken some thirty years ago [see Illustrations], which I kept as a precious record, I asked myself almost unconsciously why I was not born before; but I feel now compelled to admit that it would have been almost impossible to save it from restoration, when this was the ideal way of preserving monuments of their time, and when daily experience shows how very difficult it is to save anything in a more advanced age, when all that have the care of monuments boast of their interest in and attachment to them, and protest they will not tamper with what is ancient and beautiful. Giacomo Boni.

Counterfeited Pictures.— "The manufacturers of spurious pictures have hitherto been content to ply their trade *sub rosa*," says the *St James's Gazette*. "They seem to be growing bolder, however, for a counterfeit of one of Nittis's best-known pictures — the 'Place des Pyramides' — bearing the artist's signature, or what professes to be such, figures conspicuously in the picture-gallery of the Antwerp Exhibition. M. Jules Claretie states in the *Temps* that he has it from Mme. Nittis herself that her husband painted two pictures of the Place des Pyramids, and two only. One of these she possesses herself; the other her husband presented to the gallery of the Luxembourg, having bought it back from M. Goupil at a price of £800 for the purpose. Nittis was greatly annoyed toward the close of his life at the large traffic which had sprung up in counterfeit reproductions of his works, several instances of which came to his knowledge. Of the 'Place des Pyramids' in particular, he ascertained that there were no fewer than seventeen copies, all of them bearing a facsimile of his signature."

THE ILLUSTRATIONS.

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

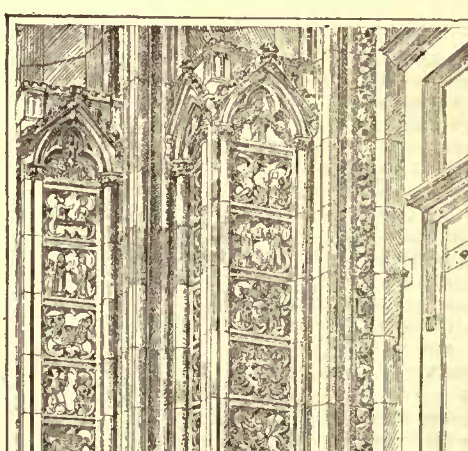
LYONS CATHEDRAL, SKETCHED BY MR. R. W. GIBSON, ARCHITECT, ALBANY, N. Y.



Cathedral Lyon

The cathedral at Lyons is of several dates, — twelfth, thirteenth and fourteenth centuries. While far from a perfect building, as a whole, it has very much that is good, both in general effect and in detail. It has strongly, too, that quality of impressiveness, which in many finer churches is lacking. The view looking across the nave into the north transept gives the character of the interior; finely-clustered shafts upon sturdy pillars, a tall, handsome main arcade, and pleasingly varied triforium. The round arches used in the transept triforium, especially, are successful, the shafts being enriched in some cases. The clerestories are not quite so good. There is a curious example here of the inaccuracy (or intentional variation) in planning such buildings which is common. The pillars on the south side of nave are at the extreme west end, nearly six feet out of the straight line of the first three from the crossing, that is, the line of pillars has a bend in it; it is not parallel with the opposite wall, nor square with the end wall. This is perhaps the most noticeable instance I have met, but lesser departures from strict accuracy are almost always to be found in mediæval buildings. The arches in an arcade are rarely of equal spans, columns are frequently of different sizes and different distances apart, and 90° is one of the most uncommon of angles.

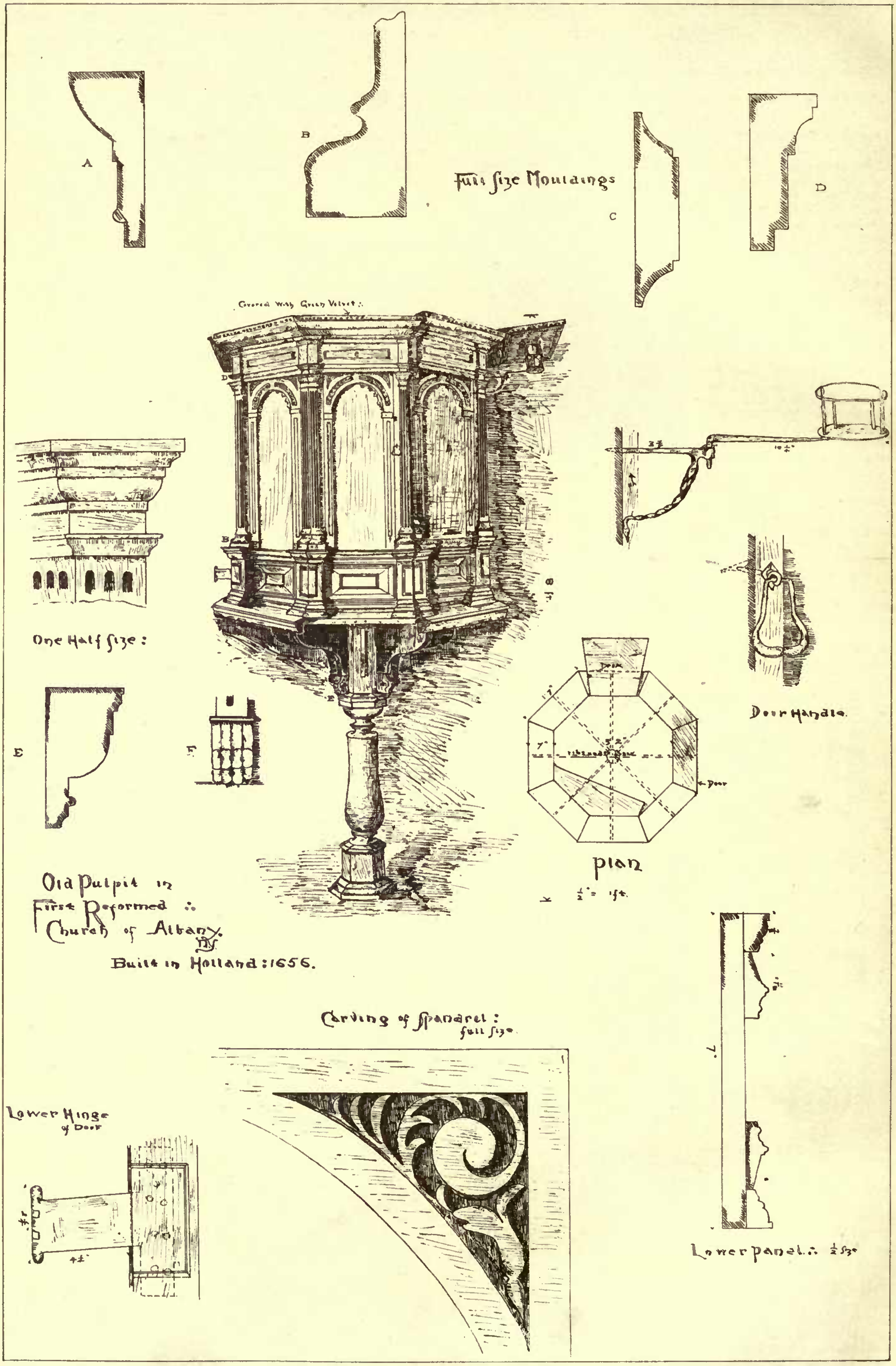
The west façade of Lyons cathedral with its three large portals is a fine composition, although otherwise the exterior of this edifice is poor, and is much hidden by surrounding houses. Each of these great doorways has three recessed jambs on each side covered with relief carvings in quatrefoils. An infinite variety of subjects is pressed into service, apparently at the whim of the stonecutter. A Bible story will get a panel, or may be two or three in order, then suddenly comes a grotesque carving without connection with the others, and frequent are subjects of rather surprising coarseness; some indeed have been plastered over for this reason. But the multitude of incidents represented, and the richness of the general effect secure an interest in the work which no other decoration can do.

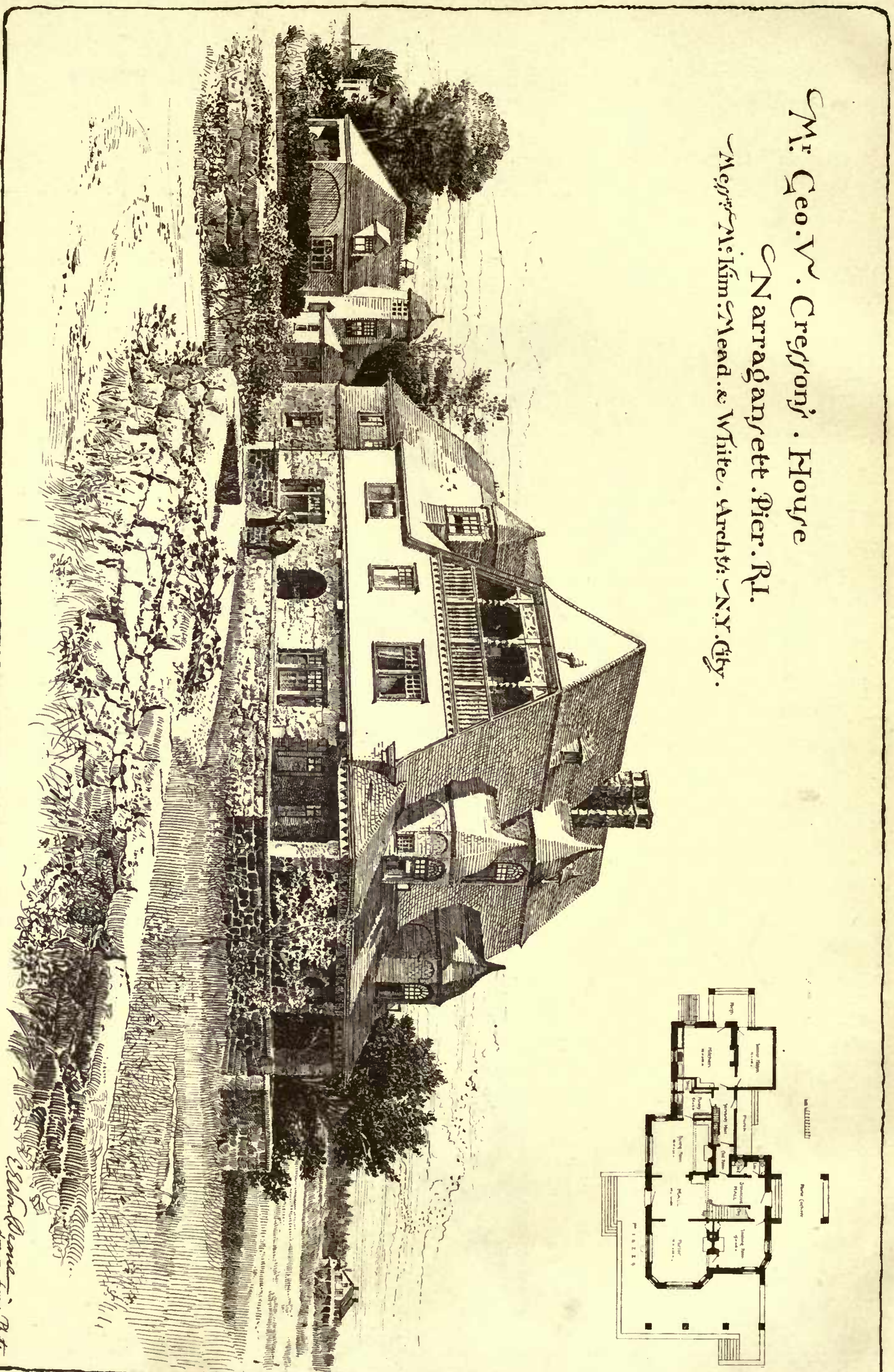


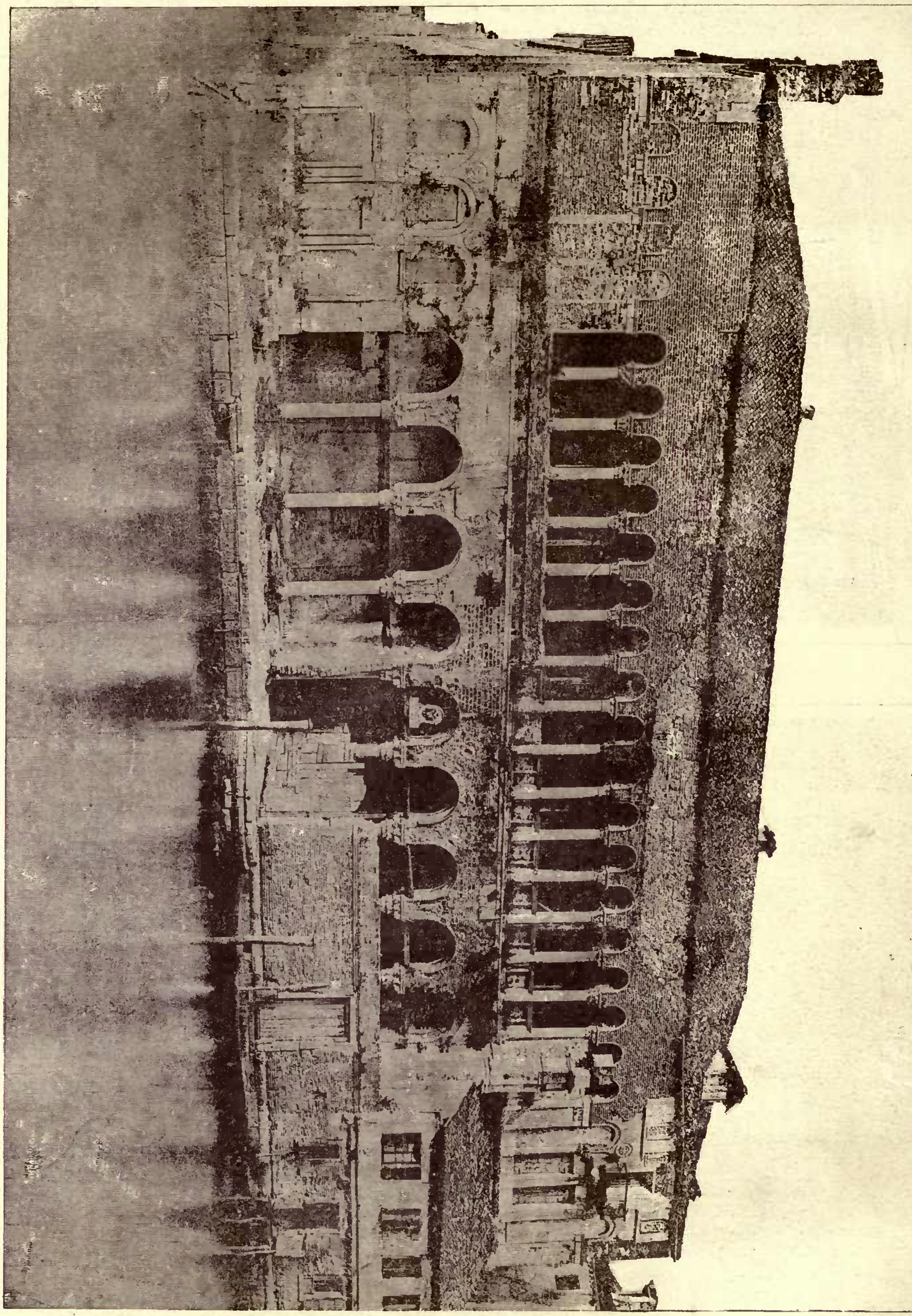
In one of the chapels of the cathedral stands the Byzantine confessional shown in the accompanying drawing. It is all of richly-carved oak; it has been recently restored.

THE OLD PULPIT IN THE FIRST REFORMED CHURCH OF ALBANY, N. Y. SKETCHED BY MR. WALTER DICKSON, ARCHITECT, ALBANY, N. Y.

This pulpit was originally in the Dutch Reformed Church, which stood at the foot of State Street from 1620 to 1805. When the church was erected, a bell and pulpit were promised by the Dutch West India Company. A temporary pulpit was substituted until its arrival. It was built in Holland in 1656, and had a canopy and winding stair, which are both destroyed. The hood is of oak and

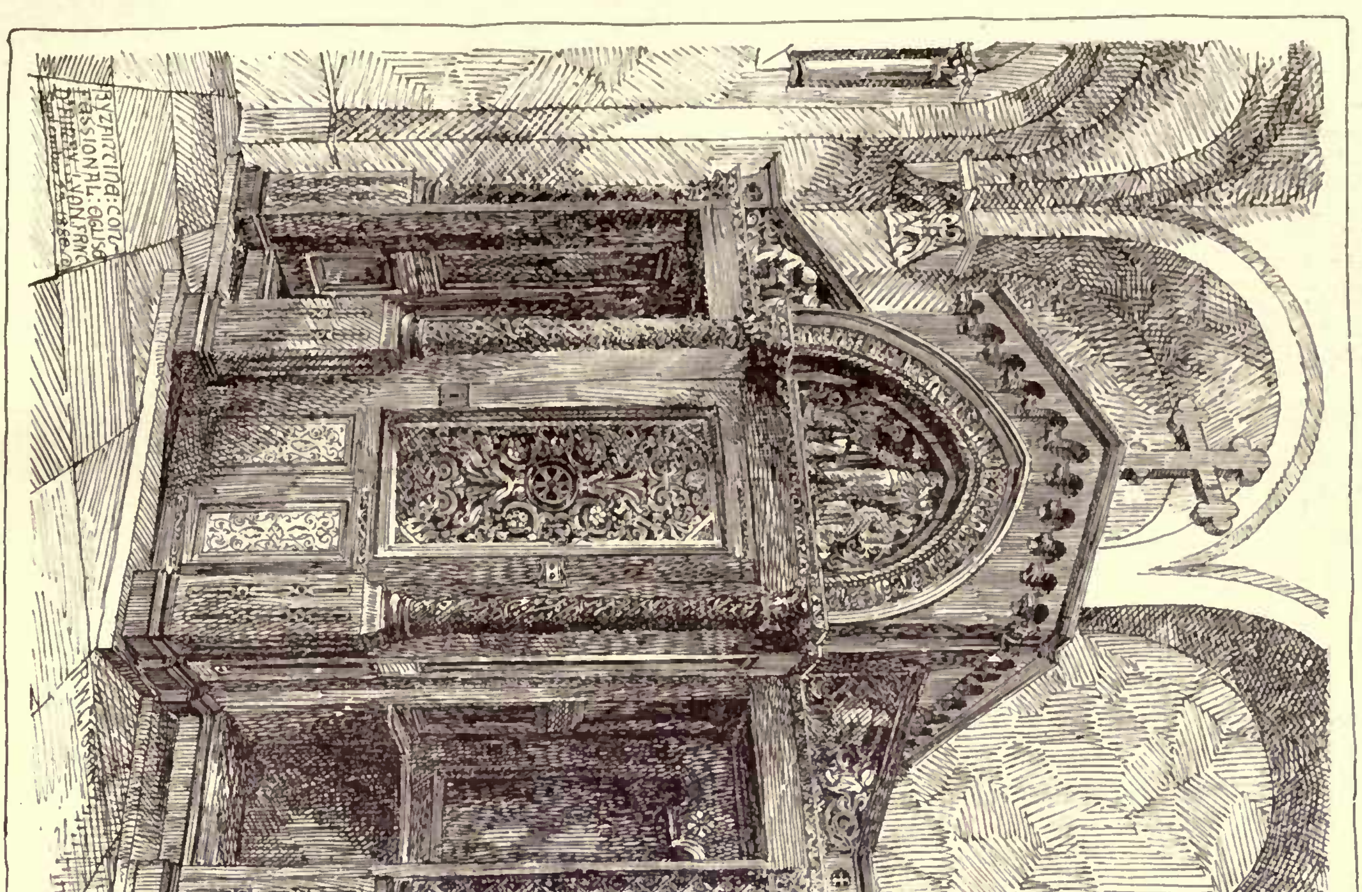

Full Size Mouldings
A
B
C
D
Covered with Green Velvet
One Half Size
E
F
Door Handle
plan
Old Pulpit in First Reformed Church of Albany. NY.
Built in Holland: 1656.
Carving of Spandrel: full size
Lower Hinge of Door
Lower panel. ½ size


Mr Geo. V. Cresson's . House
Narragansett . Pier . R.I.
Messrs McKim Mead . & White . Archts . N.Y. City.
E. Eldon Deane drawn from Photo.
HELIOTYPE PRINTING CO. BOSTON.

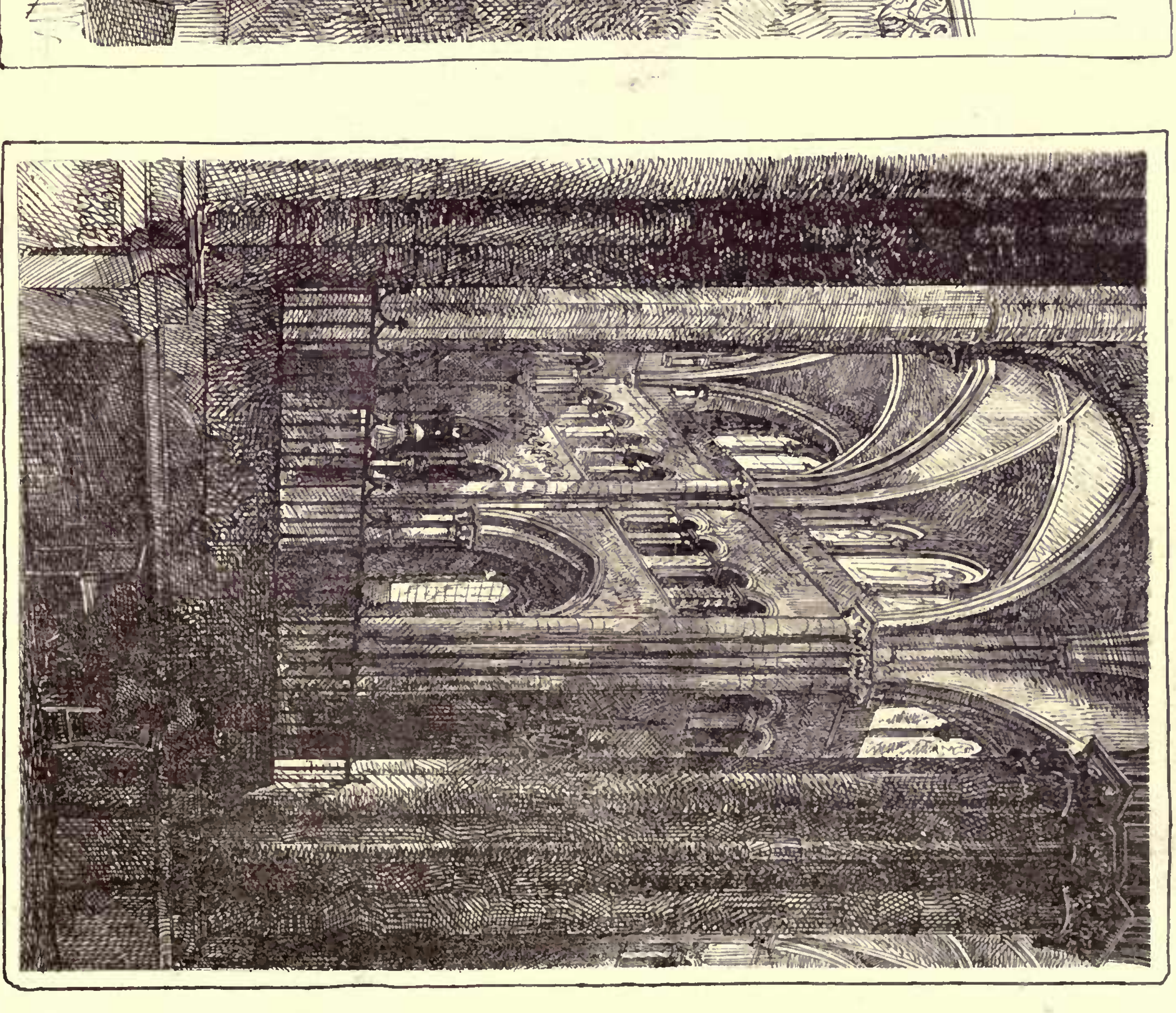


The Fondaco Dei Turchi. Venice. Italy.

HELIOTYPE PRINTING CO. BOSTON

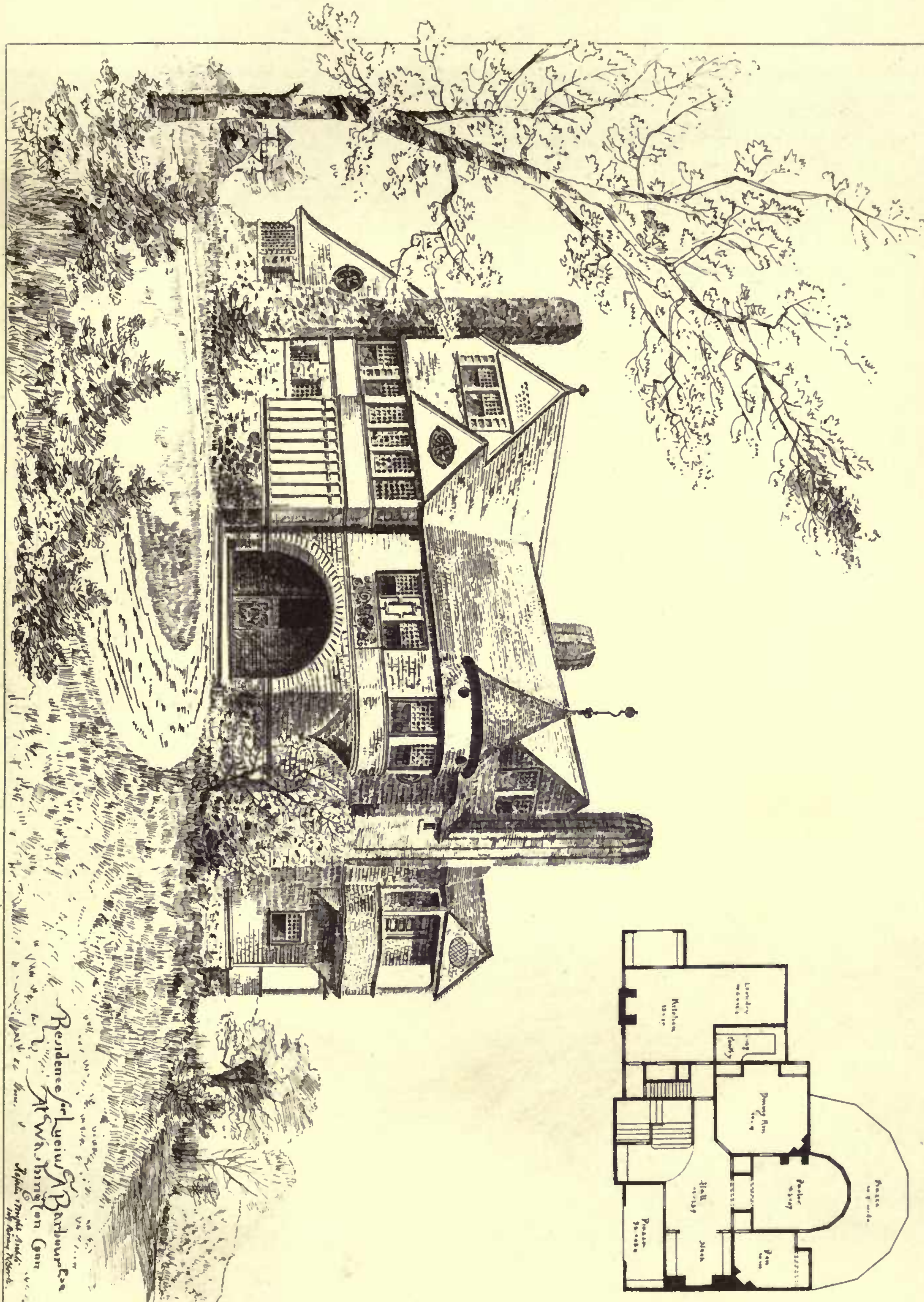


Confessional (Restored) Lyons, France



Cathedral Lyon

HELIOTYPE PRINTING CO BOSTON


Residence for Lucius A. Barbour Esq
At Washington Conn
Kitchen
Laundry
Pantry
Dining Rm
Parlor
Hall
Piazza
Den
Nook



CHURCH OF THE HOLY CROSS, AT ST. LO.

Western Entrance

the base turned. The large panels are all carved, with exception of the one on which the door is hung. The brackets underneath are carved only on the sides which were visible to the congregation. The settlers of Albany subscribed "twenty-five beavers" in payment for the pulpit; but, as the old chroniclers say, "the Chamber at Amsterdam gave 75 gilders; for the beavers were greatly damaged." This deterioration in the value of the "beavers" being thus made good, the pulpit in time found its way across the ocean and up the Hudson River to its destination. Doubtless this is the oldest pulpit in this part of the United States. It is now preserved in the Sunday-school room of the church at Albany, N. Y., after one hundred and fifty years of service. This congregation has had four distinct church edifices at Albany since the settlement of the city.

DOORWAY OF THE CHURCH OF THE HOLY CROSS, ST. LO., FRANCE.[1]

THE FONDACO DEI TURCHI, VENICE.

FOR description see article elsewhere in this issue.

HOUSE OF LOUIS A. BARBOUR, ESQ., WASHINGTON, CONN. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

HOUSE OF GEORGE V. CRESSON, ESQ., NARRAGANSETT PIER, R. I. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

A GUIDE TO SANITARY HOUSE INSPECTION.[2]



Tail-piece from engraving by Huet in l'Art.

THE great majority of buildings erected in this country are more or less defective in their sanitary arrangements. Not one in a hundred is made to submit to any official regulation, and in those few large cities where sanitary construction is enforced by law and official inspection, the security thereby afforded is necessarily only partial. The law cannot itself be made comprehensive enough to cover all the requirements, and it is moreover constantly evaded through fraud and ignorance. Such being unfortunately the case, it is a matter of very serious importance to any one intending to occupy a dwelling, to insist upon a thorough sanitary inspection of his new home. Mr. Gerhard has furnished us with an invaluable guide for this work. It comprehends the examination of the surroundings and of the soil, or the general salubrity of the site, showing us, in a few concise and sensible words, what unwholesome neighborhoods and surroundings we are to avoid, and what conditions of soil we should seek or guard against, and reminding us of the need of, and indicating how to secure suitable drainage. Then follows a careful inspection of the cellar and yard, drawing attention to the many ways in which they are dangerously defective, and touching upon the best methods of curing the defects.

Next follow the inspection of structural details; of the sewerage and plumbing; of the water-supply; of the method of garbage disposal; of the arrangements for warming, gas-lighting and ventilation of the house; and finally, of the arrangements for securing it against the danger of fire. City and country houses are properly treated separately, as also are apartment, tenement, boarding houses and hotels.

Mr. Gerhard says: "It may not seem out of place to utter a word of caution to intending buyers or lessees of houses old or new, as to the acceptance of general and indefinite statements made to them by real-estate agents. Let it be understood that it is not, at the present time, a part of the business of an agent to demonstrate the healthful condition of a property. He is simply acting in the interest of the owner or landlord who commissioned him to sell or to rent, as the case may be, a house, at as high a price and under as favorable terms as he may be able to secure. Undoubtedly the time is near at hand when it will be considered indispensable for agents and owners to produce a certificate of the healthfulness and sound construction of a house; and the natural consequence must be that houses having such proper sanitary certificate will command a much better price and find a more ready sale."

This custom would save house-owners from the very serious injury to their health they are now likely to sustain, upon entering a new home, and it is astonishing that it is not now more common. The real-estate agent is not only unaccustomed to examining critically the sanitary condition of the building he has to dispose of, but he has rarely the knowledge requisite to do this without expert aids, and for them, as well as for the owner and builder, a book like the one before us would form a most useful guide. Living in a house with improper sanitary construction means not only frequent expense and "annoyance of mechanics trying to repair an originally bad job, but, — and this is infinitely more serious, — it means frequent calls for the family physician, or continued low health of your wife and children." The expense of a "sanitary inspection" at the outset would have placed the great expense of repair where it belonged — upon the shoulders of the one who built and offered the unhealthy house for sale.

Although the author disclaims in his preface to have made in this book an exhaustive treatise on sanitary engineering, but aims chiefly at forming a guide for the search after defects, nevertheless in many cases more has been accomplished than was claimed. Thus in the chapter on the arrangements for warming the house, the directions for placing the fresh-air supply for the furnace are full and sufficient, and again the method of testing the soundness of plumbing pipes with oil-of-peppermint is minutely described. For fuller information on other subjects touched upon we are referred to the author's various works on "*House Drainage and Sanitary Plumbing*," "*Sanitary Architecture*," etc.

The work before us is simple in style and systematic in arrangement, and shows not only a thorough knowledge of the subject treated, but a familiarity with the most advanced requirements in sanitary science. The book is not merely a compilation of what has been said or written before, but is essentially progressive, providing new means for meeting the new and improved methods of construction constantly arising. Thus, under the head of Sewerage and Plumbing, recognizing the fact that it is now customary to thoroughly ventilate the sewers and all the main lines of house-drains and soil-pipes, whereby dangerous pressure is avoided within these pipes and their atmosphere is far less foul, a simpler system of house plumbing is given as admissible than was the case a few years back, when this general sewer and soil-pipe ventilation was not to be counted upon. More stress is here laid on thorough flushing of small waste-pipes than on excessive trap-ventilation, or on providing valves or other means for resisting back pressure of foul gases from the main drains, which seemed to form special features of the older works on sanitary plumbing.

Mr. Gerhard says, "Make sure that there is a proper supply of water to each fixture and trap; that all plumbing appliances are of good, smooth and non-absorbent material, and are arranged as simply as possible, without any concealed overflow-pipes or hidden channels, but with everything in plain sight, and their construction such that each fixture acts, when emptied or discharged, as a flush-tank, completely scouring the traps and branch waste-pipes, which latter should form a connecting link with the main soil-pipe, as direct and short as possible."

Mr. Gerhard also properly lays greater stress on having all plumbing work exposed to view and access than has been customary in former works. He says, "See that the fullest light and thorough ventilation prevail in the bath-room and closet for the house-maid's slop-sink, and make it a rule to have all plumbing exposed to view and accessible, doing away as much as possible with the usually ill-smelling woodwork incasing such places, particularly about the kitchen sink and the water-closet."

Other points in which this little volume shows itself to be well abreast of the times is in insisting upon the use of soil and waste pipes as *small* as is possible to carry off the waste matters without obstruction, and of plumbing fixtures constructed with outlets large enough to fill and scour them. It advises against the use of T-branches on drain-pipes. It shows the evils of using caps, return-bends or cowls at the top of the soil-pipe ventilator. "All of these are not only unnecessary but bad at all times, and positively harmful in winter time when the top of the soil-pipe gets clogged by hoar frost, causing siphonage of traps, etc."

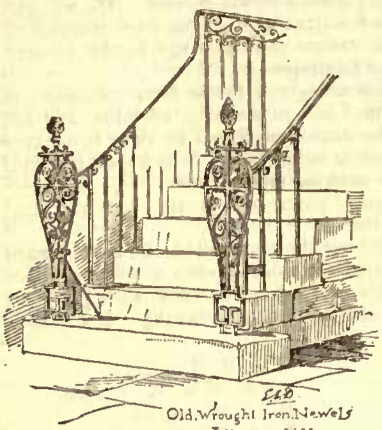
The folly is pointed out of using a disinfecting apparatus, in the hopes of rendering innocuous some ill-designed and unscientific plumbing fixture. "It is astonishing to see what a number of well-educated people commit the blunder of trusting to such worthless devices, which are nothing more than disguisers of the odor, or, at the best, mere stink destroyers. Instead of striking at the root of the evil, by removing a foul trap or defective water-closet, and by arranging the soil-pipe with a proper circulation of air, much money is uselessly thrown away in buying such 'quack' remedies. It is time that the public should know that, valuable as the sense of smell may be as an indication that something is wrong, it is not so much the smell which causes serious harm. Sewer air may be entirely deprived, by deodorizers or otherwise, of its characteristic odor, and yet be able to cause serious illness. It is far from me to underestimate the value of real disinfection in cases of infectious disease; but true disinfectants must *destroy* the organic impurities and germs of disease and not merely disguise a bad smell." "If a zymotic disease is in the house, or an epidemic raging in a city, then it is time for disinfection by strong chemical disinfectants."

[1] From Cotman's "*Antiquities of Normandy*."

[2] "*A Guide to Sanitary House Inspection*," or Hints and Helps regarding the choice of a healthful home in city or country. By William Paul Gerhard, C. E., Consulting Sanitary Engineer. New York: John Wiley & Sons, 1885.

A LONG TELEGRAPH SPAN. — The longest spans of overhead telegraph wire in the world have been put up by the French in Cochin China. Two wires have been suspended across the river Mekong at a point where it is 2500 feet wide. The posts are one hundred and sixty feet high.

ARVERNIAN ARCHITECTURE.[1]



Old Wrought Iron Newels Albany, N.Y.

We had occasion, a short time back, while on our passage through Anjou, to speak of a very marked form of architecture, of which that country is the centre. We have now to speak of another form, quite as clearly marked, but differing not a little from the Angevin variety. None of the local forms of Romanesque which arose in the latter half of the eleventh century has a more distinct character of its own than that which prevails in Auvergne. The architecture is as marked as the scenery; it would be hard to find the fellow of either anywhere else. And the Arvernian style is in some sort more satisfactory than the Angevin style. The Angevin style looks too much like a mere caprice. Why should people build churches so amazingly wide and low, and without any pillars and arches? It is always dangerous to ask, Why? in any matters of this kind.

It is hard to say why either an Arvernian or a Norman built in two different ways in those points in which they did build in two different ways, and to an Arvernian eye the Arvernian choice may seem as strictly the natural thing to choose as the Norman choice seems to us. But neither a Norman nor an Arvernian building has anything like so much the air of a whim as the Angevin building. Most of the points on which Auvergne differs from Normandy may seem fair questions of taste. Each way of building is effective; each has its own specially strong points. We do not stop and look at either simply because it is odd, which really is sometimes the case in Anjou. On one point only we must draw the line. If we ask why — unless as a mere matter of caprice — the Angevin architects left out pillars and arches, we are driven to ask why — unless as a mere matter of caprice — the Arvenian architects built their west fronts and western towers of so strange a shape or lack of shape.

But in any case none of the varieties of Romanesque art is better worth study than the noble style of which the once collegiate church of Notre Dame du Port within the walls of Clermont is, on the whole, the typical example. At Issoire[2] we find it on a greater scale, but a little later in date. Brioude has some special features of its own. At Riom we have not the pure Arvenian style, but a piece of instructive transition from that style to another. Saint Nectaire, in other points almost as typical as Notre Dame du Port, in most points wonderfully like it, differs altogether in one of the chief features of external outlines. But in all we feel, as we feel in all these local varieties of Romanesque, that the word *style* is out of place. The difference is, after all, that of a manner of building, not that of a style of architecture strictly so-called. At Clermont and Issoire, as everywhere else, it soon strikes us how much more these various types differ from one another in their general arrangements and conceptions than they do in mere detail. Here, too, we see capitals, bases, whole windows, which might belong to one country as well as another. In these matters the various styles which grew up in the eleventh century hardly differ so much from one another as the later Gothic styles do. Here is a typical Arvernian church; most of its details—certainly not its south doorway—might be found in a typical Norman church; most of them might be found in a typical Lombard church. Yet our Arvernian church, as a whole, is altogether unlike anything either Norman or Lombard. Still less is it like anything Angevin. Auvergne certainly did not sympathize with the dislike to pillars which became characteristic of Anjou. The style naturally has affinities with that of Aquitaine, the land of which in its widest sense Auvergne formed part. We come in, for instance, for the barrel-vault as a specially characteristic feature. But Auvergne loves columns and half-columns, and is not satisfied with the Aquitainan square piers. An Arvernian church shows itself at a glimpse as belonging to Southern Gaul, and not to Northern. Yet the style has quite enough distinguishing features of its own to claim to be looked on as a distinct variety of Romanesque, and for Auvergne, as distinguished from Aquitaine, to be set down as a separate architectural province.

A typical Arvernian church has a character of its own, which it is impossible to mistake. As a rule, a square tower at the west end and an octagonal tower in the middle suggest to an English eye a faint analogy to Ely or Wymondham. Very faint indeed the analogy is to either; still the square and octagon are there, however much their proportions may differ from the proportions of the square and the octagon in the only two English churches with which we can compare them. The Arvernian central octagon has a strange look in the way in which it rises, not immediately from the four limbs of the church, but from a kind of oblong base which it is not easy to describe, but which is one of the most marked characteristics of the style, within and without. The truth is that the innermost bay, so to speak, of each transept, those which in the ground-plan range with the aisles of the eastern and western limb, are carried up to the full height of the lantern. Outside, this gives the tower this broad base to spring from; if the tower was away, it would have a good deal of the effect of the high choirs of the Cistercian churches in Sicily. Inside it increases the effect of height, and it further supplies a new pair of lofty arches to increase the complication of grouping, and of arches crossing one another, some measure of which is necessarily found in every cross church. The effect of this very singular arrangement is, to our taste, certainly much better inside than it is without.

If the central octagon has a base of its own to rise from, the square tower at the west end has something of the same kind. It commonly rises from between a pair of huge shoulders, forming outside what we might almost call a western transept, but which has a very different character from the western transept of Ely. Its lower stages have a tendency to take the shape of something like a narthex, which opening into the nave by one or more arches, is sure to make a striking feature. And it is curious that this narthex not uncommonly has the air of being the oldest part of the church; at least it often contains capitals which may well be older than any of their fellows. This narthex again, as forming part of the tower, has other stages above it, opening into the church, sometimes by wide arches like the German triforium galleries, sometimes by coupled windows. Indeed most of the Arvernian peculiarities have, like this of the western tower and transept, a tendency to affect inside and outside at once. At the first glimpse of one of the churches from without, we might be tempted to fancy that, Angevin fashion, it had no aisles. The nave has lofty side walls, with arcades and windows of two stages. In the lower range the windows are placed under bold, wide, blank arches. Above these an arcade of small arches and shafts has some of its members pierced as windows. We have in fact the windows of an aisle and the windows of a clerestory; only they are placed in the same wall, one above the other. To this arrangement, which looks strange outside, we find the key within. The rule of an Arvernian inside elevation is to throw the triforium and clerestory into one. The piers, of whatever shape, are lofty; above them runs an open arcade, just below the springing of the barrel-vault, which seems universal. Inside one hardly knows whether to call it a triforium without a clerestory, or a clerestory without a triforium. It really is a gallery of the width of the aisles below, with its windows placed in the outer wall, above those of the aisle. Such an upper range of windows over the aisle windows is common in the triforia of large churches. Only then there is the clerestory rising again behind and above all. Here there is no other clerestory; the wall with its two rows of arcades and windows is the full height of the church.

The east ends follow a type which is more common both in Northern and Southern Gaul than it is in England, though it once existed in a good many English churches, from which it has now vanished. This is the type which we have already seen in so many of the churches of Poitiers, the apse with its surrounding aisle and diverging apsidal chapels. But there is one peculiarity which Auvergne seems to have to itself. The series of apsidal chapels is sometimes, not always, broken by a single square chapel in the middle, at the extreme east, making the actual east end of the church flat. Indeed this complicated and artificial arrangement of chapels becomes in these churches so completely a matter of course that we almost begin to long for the simple grandeur of the great single apse, as at Cerisy and Lucca, and at Peterborough before the addition of the retro-choir. Inside we are less likely to weary of the majestic arrangement of the columns of the apse, ranged close together with their narrow stilted arches and the clerestory above, forming a noble range of eastward *cancelli* for the high altar. We have seen this at Poitiers; we see it again at Clermont, at Saint Nectaire, and at Issoire. And, wherever we see it, we welcome it.

In the details we mark some singularities in the use of ornaments. Speaking roughly of the insides, we might say that everything is plain, except the capitals. The Arvernian architects seem to have had little notion of the application of ornament to surfaces, and not much notion of the setting of order behind order. These are such fertile sources of enrichment in our own Norman buildings that the absence seems strange to us. The actual openings of the windows, for instance, are perfectly square and plain; but there commonly is a billeted label outside and shafts within, and the capitals of the shafts, like all columns great and small, may be made as rich as any one chooses. The doorways are not very remarkable, and never have anything like the richness of our Norman doorways. Sometimes the actual opening is square, and that without any strongly-developed typanum. In the outside of the apses and transepts there is often a good deal of sculpture and inlaid work; here sometimes, and in the insides of the transepts also, we find that straight-sided batter, we can hardly call it an arch, which carries us to Lorsch and Earls Barton, and the Pictavian baptistery. Otherwise there is little in these churches to suggest the earlier types of Romanesque—nothing perhaps except the strange capitals which have been mentioned as being sometimes found at the west ends, and now and then a mid-wall shaft or an approach to it in the many groupings of small shafts and arches with which the Arvernian interiors abound. These last are a marked feature of the style. Its arrangements bring in a good many blank spaces, and each blank space is seized on to make an unglazed window within the church. Such windows are specially common over the lantern arches. The arches are commonly round; but

[1] By Dr. E. A. Freeman in the *Guardian*.
[2] See *American Architect* for August 2, 1884.

they sometimes take the shape of a kind of horse-shoe trefoil, which suggests a touch of the Saracen. He has not, however, as in some other parts of Aquitaine, suggested the use of the pointed shape for the main arches. When a pointed arch does appear in Auvergne, it may be set down as a sure sign of transition, just as in Normandy and England.

The contrast between extreme plainness in some points and extreme richness in others is strongly marked in these buildings, especially in the insides. It is curious to see a church, with every arch left perfectly plain and square, with no enrichment of any other kind whatever, but with every column, half-column, window-shaft, crowned with capitals of the richest kind, not uncommonly alive with highly Classical foliage. In weighing the disputes as to the dates of these churches, the idea often suggests itself whether the churches were not built in the latter half of the eleventh century—nothing, save an occasional fragment, suggests an earlier date than that—and whether these magnificent capitals were not often cut out in the latter half of the twelfth. At the same time we must remember that we are here distinctly in Southern Europe, in a Roman land, not in a land which is Teutonic even in that modified sense in which France and Normandy may be called Teutonic. Just as in Italy, we may fairly expect that such arts as were practised at all would be more advanced than they were in Northern Gaul, still more so than they were in England. The foundation of Notre Dame du Port is carried back to the year 580; we hear of a great repair or rebuilding in 866, after a destruction by the Northmen; we hear of building going on between 1185 and 1240. This is a little puzzling, as the first pair of dates are too early, and the second pair too late. There is nothing that one is tempted to carry back to 866, except perhaps parts of the crypt, and possibly two rude capitals in the narthex, according to the tendency which has been already mentioned. And though one could fancy the capitals throughout the church being carved in 1185, there is nothing that one could fancy belonging to as late a date as 1240. One is driven, though we may have no documentary evidence, to suppose a rebuilding in the eleventh century, with, if any one chooses, a certain embellishment in the twelfth, and to infer that the works of 1240 were mere repairs spoken of in the exaggerated way which is not uncommon.

We have pretty well described Notre Dame du Port in describing the general class of Arvernian churches, of which it is certainly the best model, though by no means on the largest scale. It shows all the peculiarities of the style, and forms an admirable introduction to it for those who see the local forms there for the first time. The apse as seen within, has its fellows at Poitiers; but neither at Poitiers nor anywhere else have we seen anything like the Arvernian nave and the Arvernian transepts. The most characteristic, perhaps, on the whole the most striking view, is that which we get out of one of the transepts, which brings out strongly that peculiar treatment of the crossing and of the transepts themselves, which is the most distinctive feature of the style. But the most distinctive feature of Notre Dame du Port itself is to be seen outside; it is the south doorway with its sculptures and inscriptions. Its architectural forms are even more remarkable than its figures of angels, prophets and saints. Nothing more unlike a Norman doorway can be conceived. Here is a square-headed opening, perfectly plain, without shafts or mouldings with sculptures on each side, but sculptures which do not touch the actual doorway. Over it is a sculptured tympanum under a flat pediment; over that is another sculptured tympanum under a horse-shoe arch. The sculptures go on in the capitals of the neighboring transept, where the Sacrifice of Isaac is prominent at one of the angles.

Both the towers are modern; but from the appearance of other churches of the type, we may infer that they fairly represent their older predecessors. The west front strikes one used to either Norman or Lombard forms as wonderfully mean and awkward. But it is the custom of the country, and we get used to it. Indeed, at Notre Dame the western part is so huddled in among houses, that we hardly take in its full proportion or disproportion. For that we must go to Issoire.

THE NEW YORK EXHIBITION OF ARCHITECTURAL DRAWINGS.

FROM beneath a pile of what we believed consisted only of used copy and proof, we have resurrected the circular which gives the necessary information concerning the Exhibition of Architectural Drawings to be held in conjunction with the Salmagundi Club, and give it below without further delay.

NEW YORK, October 1, 1885.

DURING the month of January next, an Exhibition of Architectural Drawings will be held in New York in connection with the Eighth Annual Exhibition of the Salmagundi Club. It will open on the 11th of January, and close on the 1st of February.

The undersigned have been designated as a committee to make all the necessary arrangements, and to select from the drawings that may be offered such as they may find it practicable to exhibit.

You are invited to contribute to this Exhibition.

Drawings will be received at the American Art Galleries, No. 6 East 23d Street, from Thursday, the 31st of December, to Saturday, the 2d of January, inclusive. They must be sent at the expense and at the risk of the contributors. They must either be in frames or mounted on stretchers with proper borders or mats. All those from out of town to be sent at any time before the 31st of December, to Louis R. Menger, 35 Dey Street, who, for a nominal charge, will see that they are forwarded to the galleries in due season. He will also provide frames and stretchers for drawings sent to him unmounted, at a reasonable price, and will return the drawings to the owners, mounted or unmounted, as may be desired.

The gentlemen whose names are given below have consented to act as sub-committees in Boston, Chicago, and Philadelphia, and are authorized to designate from the drawings offered for their inspection such as it may seem most desirable to send on. It is hoped that this will save contributors needless expense and trouble.

Contributors in the above-named places will please notify the local committee by the 1st of December.

All contributors will please fill out the enclosed blanks and forward to F. A. Wright, 149 Broadway, New York, as soon as practicable.

All drawings should be plainly marked on the back, with the name and address of the owner, and the title of the Drawing. If for sale, the price should be stated.

H. O. AVERY,	WM. B. TUTHILL,
C. L. W. EIDLITZ,	PROF. WM. R. WARE,
RICHARD M. HUNT,	F. C. WITHERS,
R. H. ROBERTSON,	F. A. WRIGHT, Sec., 149 *Broadway, N. Y.*

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POUND-FOOT *vs.* POUND-YARD.

LOUISVILLE, KY., November 9, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I would like to ask, through the medium of your valuable paper, why three out of four of our most prominent rolling-mills express the weights of their different sections of "shape iron" in terms of pounds per yard instead of pounds per foot?

From the writer's point of view, that of a structural engineer, the pound-foot unit is by far the best, for even if the *few* rolling-mills have a good reason for the adoption of the pound-yard unit, it is questionable whether it is of as great importance as the pound-foot unit to the *many* engineers. The engineer and architect, when dealing with iron structures, invariably use the foot-unit in preference to the yard, and the trouble of conversion from yard to feet, to the architect in making his estimates of weights and cost, to the engineer in making his estimates, his orders for the mills, his checks of invoices, though small separately, appears to the writer to be greater *in toto* than any additional trouble, if there be any, at the mill in the use of the foot over that of the yard. The conversion from the yard to the foot made by the architect and engineer gives a possibility for error which would not exist if the mills would adopt the foot in the first instance. The different sections of the mills would be more comparable, and to those using sections of the different mills, time would be saved, chances for error avoided, by the uniform adoption of the pound-foot standard.

It would therefore be to the advantage of both engineer and architect if the rolling-mills could find it convenient to adopt the pound-foot unit in place of the pound-yard.

I am, sir, yours truly, A. D. OTTEWELL.

UNREMUNERATED DECORATIVE COMPETITIONS.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Decorators must place a very low estimate on their talents, judging from the following incident, which is one of many. They are evidently willing to furnish designs for the uncertain remunerations of a possible commission. An architect writes to me, saying that he is requested to solicit designs and estimates for a stained-glass memorial window — figure compositions. On my writing for further information, and stating my objections to undertake so serious a thing as an historical composition without compensation, I receive a reply to the effect that his clients "would be unwilling to pay for a design that might not suit." With very little effort and almost no expense one might form a first-rate collection in this way. I have protested before in these columns against this suicidal policy pursued by decorators, but without result; yet I console myself with the vigorous old French saw: "*A force de forger on devient forgeron.*"

Very truly, FREDERIC CROWNINSHIELD.

A QUESTION OF COMMISSION.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Your opinion on the following statement of fact is waited for with interest: A. has decided to erect a building. That the best results may be attained, he concludes to have a competition for the plans. So he issues a circular to a number of architects in this and other States. The circular sets forth the requirements of the building, and I would say that it is the best one that has come to my notice.

Paragraph six of said circular reads as follows: "The successful competitor alone shall receive compensation for his *plans, specifications* and *details*; all other plans to be returned."

Paragraph eighth is as follows: "It is the expectation of the Board to erect the building under the supervision of a superintendent of construction, and the specifications and details must be full and complete enough to enable the Board to contract for each branch of work separately. Personal supervision of the architect will, therefore, not be required."

Paragraph nine: "The compensation for plans, details and specification shall not exceed two-and-one-half per cent of cost."

Paragraph ten: "The Board, in the selection of a plan, will be aided by a skilled architect."

Plans were submitted, and after due examination a vote resulted in the unanimous choice of a design submitted by "B.," who, immediately after consultation with "A.," prepared said plans in accordance with paragraph eight as above. The work was let in separate contracts. The plans showed the necessary arrangement of all hot and cold air-flues, registers, ventilation-flues, hollow floors, location of furnaces, and the specifications set forth all necessary instructions in detail. It was known at the time of commencing work on the working-drawings what furnace would be used; in fact, the Board had awarded the contract for the furnaces at that time.

Question: Is B. fairly entitled to receive commission on the cost of the furnaces, as under paragraph nine? B.

[Yes.—Eds. American Architect.]

NOTES AND CLIPPINGS.

Sale of the Great Eastern. — The Great Eastern, the largest steamship in the world, was sold at public auction October 30, for £26,-200. The construction of the Great Eastern was begun May 1, 1854, and the work of launching her, which lasted from November 3, 1857, to January 31, 1858, cost £60,000, hydraulic pressure being employed. Her extreme length is six hundred and eighty feet, breadth eighty-two and one half feet, and including paddle boxes one hundred and eighteen feet, height fifty-eight feet, or seventy feet to top of bulwarks. She has eight engines capable in actual work of 11,000 horse-power, and has besides twenty auxiliary engines. She was sold in 1864 for £25,000, and was employed on several occasions with success as a cable-laying vessel.

Crushing Limit of Columns. — In preparing a plan for an electric lighthouse, M. Bourdais, the architect of the Palace of the Trocadéro, investigated the height to which a column of different materials could be raised without crushing under its own weight. The weight of a pyramid with a square base may be expressed by the equation:

$$P = D^2 \frac{h}{3} \delta$$

in which D represents the side of the base of the pyramid, h the height, and δ the density.

The resistance is: $$R = \frac{P}{D^2}$$

Hence $$R = \frac{1}{3} h \delta$$

$$h = \frac{3R}{\delta}.$$

If we take for the limiting value of R one-sixth of the load, which produces crushing in iron, and one twentieth for different varieties of stone, we may deduce the following table:

Material.	R.	δ.	H.
Prophyry,	2,470,000	2,870	2,550 metres.
Iron,	6,000,000	7.800	2,280 "
Granite,	800,000	2,700	900 "

Such are the practical limits to which a pyramid might be raised in the respective materials. It is evident that the Egyptians, in the great pyramid of Cheops, stopped far below the limit. If the prismatic form were adopted, the height could be only one-third as great. — *Lumiére Electrique*, February 21, 1885.

Old New York Fireplaces. — On "Monday, October ye second," just 181 years ago, a Boston lady undertook a journey to New York city, an account of which was published in 1825, from a diary in the author's own hand-writing, "being a faithful record of Madam Knight's adventures over 'that tract of country where she traveled about a fortnight on horseback under the direction of a hired guide.'" Madam seems to have been much pleased with New York, where she made many acquaintances amongst the good women of the city, "who courteously invited me to their houses, and generously entertained me." And her description of the city at that time is well worth reading. She says: "The Cittie of New York is a pleasant well compacted place, situated on a Commodious River which is a fine harbor for shipping. The Buildings, Brick Generaly, very stately and high, though not altogether like ours in Boston. The Bricks in some of the houses are of divers Coullers and laid in Checkers, being glazed look very agreeable. The inside of them are neat to admiration, the wooden-work, for only the walls are plastered, and the Sumers and Gist are plained and kept very white scowr'd as so is all the partitions if made of Bords. The fire-places have no Jambs (as ours have) But the Backs run flush with the walls and the Hearth is of Tyles and is as farr out into the Room at the Ends as before the fire, which is Generally Five foot in the Low'r rooms, and the piece over where the mantle tree should be is made as ours with Joyner's work, and as I supose is fasten'd to iron roods inside. The House where the Vendue was, had Chimney Corners like ours and they and the hearths were laid with the finest tile that I ever see, and the staircases laid all with white tile which is very clean, and so are the walls of the Kitchen which had a brick floor. They were making Great preparations to Receive their Govenor, Lord Carnbury from the Jerseys, and for that End raised the Militia to Gard him on shore to the fort."— *Weekly Statement.*

Prices for Old French Furniture. — The Executors of the late Earl of Craven having decided to sell the fine old French furniture of the time of Louis XIV and Louis XV, it was disposed of by auction on Tuesday last. It was mostly considerably worn, but, being of such excellent work and style, it nevertheless brought high prices. The drawing-room suit, in the style of Louis XIV, carved and gilt chairs, with ottomans and settees covered in crimson satin damask, sold for £367 10*s.*; an inlaid rosewood and tulipwood table, Louis XV style, mounted with ormolu, for £73 10*s.*; a fine old Louis XIV black buhl writing-table, mounted in ormolu, £52 10*s.*; a very handsome old buhl and tortoise-shell writing-table of the same style, £73 10*s.* Several other good pieces of furniture sold at from 40 to 50 guineas, the purchasers being all the principal dealers in old furniture. — *London Times.*

The Commission on the new Tower Bridge. — Rather a nice point was raised at a meeting of the Court of Common Council last week as to who should superintend the erection of the proposed Tower Bridge, Mr. Horace Jones, as well known, is the City architect, a position which has attached to it, what one of the deputies described as "a handsome salary." Mr. Horace Jones had prepared the design for the bridge which had received the sanction of the Legislature, but he had very properly declined being responsible for carrying out such a large engineering work. It was proposed, therefore, that Mr. J. Woolfe Barry and Mr. Horace Jones should jointly undertake the work, the latter gentleman superintending such part as would fall within his more immediate province. Mr. Barry not being in receipt of "a handsome salary" from the City, very naturally desired to be remunerated for his services, and had intimated that he should expect the standard commission of five per cent, and as the Parliamentary estimate was £610,000., this would amount to £30,500. After a good deal of discussion the Court agreed by majority of forty-two votes that £30,000 should be paid to Mr. Jones and Mr. Barry, and they should be left to agree between themselves how they should divide the sum. The arrangement certainly leaves room for citizens and tax-payers who may be at all inclined to be captious to make unpleasant remarks. Supposing the building of bridges, even the architectural part of such structures, is outside the pale of Mr. Horace Jones's duties, it would have been far better, so the captious ones will say, to have employed an independent architect. Mr. Jones must either have a deal of slack time on his hands or he will have to put in a powerful quantity of overtime if he is to earn any considerable portion of the £30,000. On the other hand, Mr. Jones has already done more that he was legally obliged to do in return for his "handsome salary" in preparing the designs, and doubtless fully deserves a little extra consideration in consequence of the extra work and responsibility thrown on his hands; besides which he will no doubt have to engage quite a considerable staff in carrying out the details of the design. These jobs are never the lucrative thing that ordinary people imagine them to be — *Engineering.*

Telpherage. — Telpherage is the name which has been given to a system of automatically-transporting goods by the agency of electricity as the motive power, which system was the invention of the late Professor Fleeming Jenkin. Dying in June last, however, the Professor did not live to see his ingenious ideas carried out on a practical scale. He had begun the construction of a telpher line on the estate of Lord Hampden, at Glynde, near Lewes, but his plans had to be perfected by Professor Perry, his successor as the engineer to the Telpherage Company. This line has been completed, and was formally opened on Saturday, October 17, by Lady Hampden, who electrically started a loaded train on the line. A special train conveyed a large number of visitors from Victoria Station to Glynde. The line is a double one, nearly a mile in length, and is composed of two sets of steel rods, three-quarters of an inch in diameter, supported on wooden posts of T-shape, and about eighteen feet high. The wires are supported one on either end of the cross-piece of the T, which is eight feet long. The carriers, or skips, as they are technically termed, are iron trough-shaped buckets, each holding about two hundred weight, and suspended from the line by a light iron frame, at the upper end of which is a pair of grooved wheels running on the line of rods. A train is made up of ten of these skips, which are in electrical connection with each other, and with an electrical motor which is placed in the middle of the train, having five skips in front of and five behind it. At a point about midway of the length of the line is the engine-house, in which is a steam engine which drives the dynamos. From these latter the current is led to the line and thus to the electrical motor which moves the train. The use to which the line is put is to carry clay from a pit to the Glynde Railway siding, whence it is delivered into trucks, and transported by rail to the works of the New Haven Cement Company. At the charging end of the telpher line the skips are loaded each with about two hundred weight of clay, the train thus carrying one ton. A laborer, by touching a key, starts the train, which travels at a speed of from four to five miles an hour along the overhead line to the Glynde Station. Arrived there another laborer upsets each skip as it passes over a railway truck, into which the clay is thus loaded. This upsetting, however, will eventually be performed automatically by means of a lever on each skip, which will come in contact with a projecting arm as it passes over the truck. The laboror at the discharging end of the line has full control over the train, and can stop, start and reverse it at will, as can also the man at the other or loading end. There are two trains at Glynde, but only one is at present used, that being found sufficient to deliver one hundred and fifty tons of clay per week at the station — the *minimum* quantity required by the cement company. The trains need no attention when running, as they are governed to run at the same speed both on rising and falling gradients. An automatic block-system is provided, so that as many as twenty trains can be run on the line without the possibility of collision. The telpherage line at Glynde being the first erected, it is admitted that its details are capable of improvement. It, however, successfully demonstrates the ingenious idea of Professor Jenkin in utilizing electricity as a source of motive power. Beyond this it can hardly be said to go at present. — *London Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

TRADE SURVEYS.

THE week's announcement of new enterprises exhibits an improvement in activity in the larger Eastern cities, especially. In the West, less new business has been brought to the attention of architects. A vast amount of work is constantly underway, with which architects have little if anything to do, and of which the average city builder is ignorant. Much work of this character is in progress, especially in the South and West, and comes under the general heading of railroad and industrial operations, wherein the constructing and manufacturing companies are themselves doing the work, directly or indirectly. A lull in architects' offices means very little, taking into account the entire work of construction throughout the States. Chief interest in new enterprises is at present centred in railway projections, in grain-elevator work, in the building of new or extension of old mills, shops and factories, and in the development of coal, lumber and other raw resources. The withdrawal of large volumes of money for employment in the widening channels of industrial and commercial activity has been observed for several weeks, and is exerting the most healthful influences on business. The facts most apparent on the surface to-day, are in brief, these: railroad-building has received an impetus, iron and steel are in improving demand, and reasonable prices have been established; the bridge-builders have received large additional orders within a week; orders for three thousand cars have been placed within two weeks, orders for seventy or eighty locomotives have been given out since November 1; orders for skelp-iron to make pipe for natural-gas are far behind, and mills for skelp and pipe are overrun. Bar, sheet, plate and tank iron mill managers report fair activity, but medium quotations. Additional activity is reported in those avenues of activity engaged in furnishing motive power, lathes, tools, presses, elevators, implements, etc. The most expressive phrase to characterize the spirit of existing activity is the presentation of withheld demands. Special and perhaps undue reference is made to the iron and associated industries, because they pretty correctly reflect existing and prospective conditions in many other branches. The railroad managers and builders in ordering rails, locomotives, cars and smaller railway material are supplying urgent demands and providing for future requirements now clearly in sight. The manufacturers of textile goods are ordering new machinery, with sufficient force to reinstate an increased force of twenty-five per cent in nine or ten of our best-known machinery making establishments. Wool and leather are higher. Lumber dealers are counting on an advance. Dealers in all material that can be classed as "raw," predict an improvement, because of enlarging demand and growing necessities. Five new iron-mills have been projected, three new blast-furnaces, twelve new steel-works are now building. A ten-per-cent increase in carpet and hosiery factories will be ready for next spring. These are significant facts, and are mentioned as helping to concentrate more light on the central and all-absorbing question of building probabilities. We have not yet reached the limits of requirements in any branch, rather, the expansion of demand is greater than the expansion of facilities. A characteristic of next season's activity will be public buildings, such as municipal buildings, churches, school-houses, theatres, etc. Second in importance will be houses ranging from $5,000 to $50,000 in value. Hotel-building will be an important factor in New York, Philadelphia, Chicago and one or two other cities. Hotel-building at "resorts" is taking extensive dimensions. The American people are cultivating a French characteristic as to their social requirements, and the summer-hotel life is likely to be encouraged by the temptations which will be extended by fine hotels in desirable localities, exquisitely fitted up, instead of summer boxes, devoid of home comforts and of architectural features.

The outpouring to the suburbs in all our large cities will continue next season. This activity, which began in the Eastern cities, is extending westward. Chicago architects and St. Louis architects have built more $3,000 to $10,000 houses this year than usual for people who have surrendered old homes to the business demand. The Western architects have even now more cheap work in hand than the architects of Eastern cities, but the latter will overtake their Western co-workers before the middle of winter in a finer class of city work. Cheap dwellings will be multiplied everywhere. The demand in nearly all cities, according to the best real-estate authority, is excellent, and building will be pushed with vigor, though, as a rule, architects have not been called upon to do the work.

A large amount of work will be prosecuted on the opening of spring in supplying cities and towns with water and gas. In a few cases contracts have already been awarded, but in most cases municipal authorities have only determined on the work. The list of such enterprises will exceed forty. The manufacturing corporations are springing up to produce and manufacture a vast variety of articles from iron, slate, ice, and gas, to silk. The industrial decentralization in progress is strengthening the foundation of business, and making reactions, depressions and panics less probable. Every week brings to light some new development, some additional opportunities for money and skill, but with all the rapid progress made, there is a surplus of capital and energy awaiting their turn.

More or less apprehension exists as to the probable course of the wage-workers next spring. A general movement will be made to inaugurate an eight-hour movement. The building trades will be expected to lead in the movement. Various branches of labor organizations have resolved to work two hours per day less after May 1st, regardless of the expected reduction in wages. A large portion of the expected support declines to promise so far in advance what course will be pursued, because of the unwillingness to lose twenty per cent in wages, besides the possible loss of employment for labor content to work ten hours per day. The spirit of organization is permeating all classes of labor North and South, and it is probable that soon or late any movement receiving the united support will become a serious one. The cost of labor is relatively advancing, and its compact organization will not weaken the upward tendency. The movement is, from the labor standpoint, the wisest ever made, and the most difficult one to deal with on the part of the employers in need of services. There is only one step from an established eight-hour day and ten-hours day pay.

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

329,885. SUPPLY-TANK FOR WATER-CLOSETS. — Wm. Bunting, Jr., Boston, Mass.

329,892. COMBINED GUAGE AND CENTER-SQUARE. —John C. Eckert, Dayton, O.

329,893. SCREEN.—Jonathan C. and Edgar W. Ela, Boston, Mass.

329,894. BLIND, SHUTTER OR DOOR STOP. — John C. Evans, Denver, Col.

329,900. METHOD OF MAKING ROLLED WOOD-SCREWS.—Hayward A. Harvey, Orange, N. J.

329,923. COMBINED WATER AND AIR-HEATING APPARATUS.—Thomas A. McDonald, Boston, Mass.

329,931. VALVE MECHANISM FOR WATER-CLOSET CISTERNS.—George R. Moore, Philadelphia, Pa.

329,938. STOPPER FOR BURST PIPES. — Albert Nicollet, Newark, N. J.

329,946. SET BASIN. — John P. Putnam, Boston, Mass.

329,947. OVERFLOW-PIPE FOR SET BASINS AND SIMILAR FIXTURES.—John P. Putnam, Boston, Mass.

329,968. APPARATUS FOR SINKING WELLS. — Michael Stopper, Cincinnati, O.

329,973. FIRE-PROOFING WOOD. — Rudolf Tanczos, Vienna, Austria-Hungary.

329,986. RATCHET-DRILL. — Pardon A. Whitney, Chagrin Falls, O.

329,993. CHIMNEY-TOP. — Irving Barker, Braidwood, Ill.

329,995. AUTOMATIC DAMPER-REGULATOR. — Robert Beachmont, Lyons, N. Y.

330,002. BRICK-MACHINE.— Samuel Daly, Metropolis City, Ill.

330,018. DRIER.—Ludwig Hagen, Magdeburg, Prussia, Germany.

330,085. SHUTTER-WORKER.—John B. Armstrong, Augusta, Ga.

330,090. SLIDING DOOR. — Wm. S. Brickell, Olean, N. Y.

330,103. FIRE-ESCAPE. — John Flietner, Brooklyn, N. Y.

330,104. HAND-SAW.—Alfred Fornander, Brooklyn, N. Y.

330,105. SASH-HOLDER.—John G. Fowler and Walter H. Crisp, Mankato, Minn.

330,110. CONCRETE PAVEMENT. — John Grant, Omaha, Neb.

330,121. LIME-KILN. — Joshua Hunt, Catasauqua, Pa.

330,138. DOOR-CHECK. — Adam Maurer, San Antonio, Tex.

330,148. STENCH-TRAP. — John A. Paine, Tarrytown, N. Y.

330,175. PIPE-CUTTER.—Nathaniel W. Vandergrift and Frank Armstrong, Bridgeport, Conn.

330,179. MEANS FOR DETECTING AND CARRYING OFF LEAKAGE FROM GAS-MAINS. — George Westinghouse, Jr., Pittsburg, Pa.

SUMMARY OF THE WEEK.

Baltimore.

GAS-WORKS. — The Chesapeake Gas Co. are building a purifying-house, 60′ x 150′; engine and condenser house, 44′ x 100′; boiler-house, 44′ x 57′; smoke-shaft, 10′ x 10′, 70′ high; retort, generator and carburetter-house, 63′ x 152′, with wing, 20′ x 30′, fire-proof; oil-pressure tower, 21′ x 21′, 70′ high; office and meter building, 50′ x 100′; all two-st'y buildings, of brick, with cut granite bases and trimmings; also coal-house, 50′ x 100′, and lime-house, 30′ x 60′, of wood. Cost of entire works and pipe-laying, $2,600,000; cost of buildings, exclusive of machinery, $200,000; Chas. F. Dietrich, chief engineer; Henry Brauns, architect.

FACTORY AND STORAGE WAREHOUSE. — Henry Brauns, architect, has prepared plans for Messrs. G. W. Gail & Co., for a six-st'y pressed-brick front building, with granite trimmings, 134′ x 183′; cost, $190,000.

BUILDING PERMITS. — Since our last report twenty-three permits have been granted, the more important of which are the following: —

A. S. Porter, a three-st'y and 3 two-st'y brick buildings, w s Upton St., n of Lanvale St.

Frederick Stamp, 2 two-st'y brick buildings, w s Ettinge St., s of Robert St.

Geo. W. Parks, 5 two-st'y brick buildings, Bowen St., between Cross and Stockholm Sts.

Geo. A. Wagner, 8 two-st'y brick buildings, s s Heath St., between Patapsco St. and Harman Alley.

Jos. H. Pfister, 7 two-st'y brick buildings, e s Port Alley, between Eastern and Canton Aves.

Wm. Carback, 4 two-st'y brick buildings, w s Chapel St., between Chew and Eager Sts.

Frederick Tinley, 13 two-st'y brick buildings, n s Wilkins Ave., beginning n e cor. Addison Alley; and 2 two-st'y brick buildings, e s Addison Alley, n of Wilkins Alley.

H. G. McGrath, three-st'y brick building, n s Canton Ave., between Chester and Duncan Alley.

H. Miller & Co., 2 two-st'y brick buildings, s s Lancaster St., between Burke and Luzerne Sts.

Chas. Milske, 8 two-st'y brick buildings, e s Castle St., s of McElderry St.

Jos. M. Cone, 20 three-st'y brick buildings, e s Bolton St., between Laurens St. and North Ave.

Boston.

BUILDING PERMITS. — *Rossiter St.*, near Union Ave., dwell., 13′ and 25′ x 28′; Hazard Stevens, owner; E. F. Moulton, builder.

Bernard St., near Park St., dwell., 26′ 9″ x 35′; A. A. Wescott, owner; builder, same as last.

Fairview St., near Train St., dwell., 36′ x 41′ 6″; G. A. Noyes, owner; Noyes Bros., builders.

Harbor View St., near Dorchester Ave., dwell., 24′ x 42′; R. Chapman, owner; John Hicks, builder.

Grant St., near Harbor View St., dwell., 20′ x 29′; Mrs. Annie Riley, owner; Peter Riley, builder.

Border St., *No.* 406, storage, 20′ x 60′; Mrs. S. G. Bennett, owner; S. G. Bennett, builder.

Pratt St., near Ashford St., dwell., 21′ x 28′; J. F. Cooper, owner and builder.

Saratoga St., storage, 10′ x 20′; J. Mulhern, owner; E. Downing, builder.

Brooklyn.

BUILDING PERMITS. — *Moore St.*, *No.* 100, s s, 125′ w Humboldt St., three-st'y frame tenement, tin roof; cost, $4,300; owner and builder, John Kertz, on premises; architect, Th. Engelhardt.

Fifth Ave., e s, 65′ n Sterling Pl., 2 four-st'y brick and terra-cotta apartment-houses, tin roofs; cost, $24,000; owners, McLaughlin, McConnell & Myers, 415 Pacific St.; architect, W. M. Coots.

Hancock St., s s, 60′ e Marcy Ave., three-st'y terra-cotta and brick dwell., Sparham fire-proof cement roof; cost, $10,000; owner and architect, Montrose W. Morris, 45 and 47 Exchange Pl., New York; builders, E. T. Rutan and A. Beinhauer.

Stockton St., s s, 270′ e Nostrand Ave., three-st'y brick woollen factory, asphalt roof; cost, $4,500; owner, architect and builder, John Clarke, 675 Willoughby Ave.

Halsey St., s s, 250′ w Reid Ave., 3 two-st'y brick dwells., tin roofs; cost, $5,000; owner and builder, P. Ward, 723 Gates Ave.; architect, J. D. Hall.

Putnam Ave., n w cor. Sumner Ave., four-st'y Connecticut brown-stone store and dwell., tin roof; cost, $12,000; owner, Mrs. Mary J. Robb, 1035 Lafayette Ave.; architect, C. Baxter; builder, M. J. Reynolds and J. McLean.

Herkimer St., s s, 100′ w Schenectady Ave., 6 two-st'y frame dwells., gravel roofs; total cost, $10,000; owner, Emma Taylor; architect, H. Taylor.

Woodbine St., *No.* 126, s s, e Evergreen Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,500; owner, W. W. Ford, 124 Woodbine St.; architect, J. S. Sagar.

Hull St., n s, 306′ e Rockaway Ave., 8 three-st'y brick dwells., gravel roofs; cost, each, $4,500; owner, Richard I. Robbin; architect, B. T. Robbin; builders, E. K. Robbin and J. Remsen.

Seventh Ave., w s, 40′ s Tenth St., 2 three-st'y brown-stone stores and dwells., tin roofs; cost, $12,000; owner, Chas. G. Peterson, 174 Thirty-ninth St., South Brooklyn.

Howard Ave., w s, 99′ n Halsey St., 4 two-st'y brick dwells., tin roofs; cost, each, $4,000; owner, James Chayce, 833 Van Buren St.; architect, P. Young; builders, L. N. Smith and James Chayce.

Kent St., *Nos.* 134, 134½ *and* 138, s s, 275′ w Manhattan Ave., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $4,000; owners, Kuntz & Holthausen, Calyer St., cor. Eckford St.; architect and contractor, C. Dunkirk; masons, Gately & Smith.

McDonough St., s s, 95′ w Hopkinson Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,300; architect, John Platte; builder, H. Loeffler.

Eighteenth St., s s, 275′ 5″ e Seventh Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owners and contractors, Messrs. Walberg & Dieckmann, 400 Eighteenth St.; builder, O. O'Keefe; architect, W. H. Wirth.

Fifteenth St., s s, 244′ w Fifth Ave., 2 three-st'y brick tenements, tin roofs; cost, each, $5,000; owners, H. & J. Barkeloo, Van Brunt St.; architect and contractor, Thos. Corrigan; mason, W. Corrigan.

Second St., n e cor. Bond St., three-st'y brick store and tenement, tin roof; cost, $5,000; owner, Mary E. Lynch, 825 Union St.; architect, I. D. Reynolds; builder, J. McLean.

Monroe St., n s, 350′ e Stuyvesant Ave., two-st'y brick dwell., tin roof; cost, $3,500; owner, C. M.

Turner, 208 High St.; architect, E. L. Messenger; builders, Laney & Moran.

Second St., n s, 21' e Bond St., 2 three-st'y brick dwells., tin roofs; cost, each, $5,000; owner, Mary E. Lynch, 825 Union St.; architect, I. D. Reynolds; builder, J. McLean.

Broadway, n e cor. Stewart St., 2 three-st'y frame (brick-filled) stores and tenements, tin roofs; total cost, $10,000; owner, architect and builder, Walter E. Maryatt, 525 Quincy St.

Alterations. — *Wolcott St.*, w s, 125' s Conover St., add two stories, flat tin roof, also new cellar; cost, $4,400; owner, Miss Margaret Madigan, 123 Wolcott St.; architect, P. H. Gilvary; builders, M. Gibbons & Son and D. J. Lynch.

Third St., *Nos.* 75 *and* 77, add two stories, front of stable taken down, and new store front, etc.; cost, $6,500; owner, John T. Pinckney, 75 Third St.; architect, A. E. White; builders, P. Carlin & Son and C. M. White.

Chicago.

Building Permits. — W. Gruby, three-st'y flats, 295 Chicago Ave.; cost, $10,000; architect, F. Beaumann.

H. A. Belding, 2 two-st'y dwells., 62-64 Bryant Pl.; cost, $10,000.

W. Kamp Bros., three-st'y store and flats, 3106 Halsted St.; cost, $7,000.

A. H. Lowden, 2 two-st'y dwells., 3231-3233 Groveland Park; cost, $12,000; architect, A. H. Lowden.

S. E. Gross, 11 two-st'y dwells., Sacramento St.; cost, $25,000; architect, L. G. Hallberg.

C. B. Schel, two-st'y flats, 988 West Twelfth St.; cost, $3,800.

F. Henneberry, basement, 872 Ashland Ave.; cost, $5,000.

Maxwell Bros., barn, 771-773 Loomis St.; cost, $4,000.

Sheldon Estate, addition, 263-265 Wabash Ave.; cost, $5,000.

F. B. E. Backins, four-st'y flats, 234 North May St.; cost, $8,000.

Mrs. M. Foote, two-st'y dwell., 1038 Wilcox Ave.; cost, $3,500.

T. H. Gault, 6 two-st'y dwells., 3401-3413 Prairie Ave.; cost, $25,000; architects, Copeland & McGrath.

J. Houtnik, two-st'y addition, 614 Eighteenth St.; cost, $2,700.

J. Conley, three-st'y flats, 86-88 Quincy St.; cost, $6,000.

Bartholamae & Roesing, elevator, 333 West Twelfth St.; cost, $10,000; architect, W. M. Wanger.

Mrs. H. Adler, 2 two-st'y dwells., 3541-3543 Ellis Ave.; cost, $6,000.

E. B. Felsenthal, two-st'y dwell., 3545 Ellis Ave.; cost, $3,000.

F. M. Fargo & Lobdell, 6 two-st'y dwells., 34-44 Ray St.; cost, $24,000.

C. C. Nardin, two-st'y dwell., 403 Robey St.; cost, $2,900.

J. C. McCord, barn, Thirty-fourth St.; cost, $5,000.

R. Brand, three-st'y addition, Clybourne Ave.; cost, $10,000; architect, C. H. Gottig.

H. Sweet, three-st'y store and flats, 1460 Milwaukee Ave.; cost, $4,000.

H. Sweet, 2 three-st'y store and flats, 1522-1524 Milwaukee Ave.; cost, $6,000.

F. Huba, two-st'y flat, 43 Tell Pl.; cost, $4,500.

Dr. Byford, 2 two-st'y dwells., 3243-3245 South Park Ave.; cost, $7,000; architect, W. A. Furber.

C. Ickes, three-st'y ice-house, 155 North Wells St.; cost, $6,000.

A. Merriger, three-st'y store and dwell., 439 North Wells St.; cost, $4,000; architect, C. H. Gottig.

K. G. Schmidt, three-st'y store and flats, 131-137 North Ave.; cost, $12,000; architect, P. Huber.

B. Summers, four-st'y store and flat, 626 West Van Buren St.; cost, $7,000; architect, J. C. Garvell.

H. G. Hangan, two-st'y dwell., 169 Fremont St.; cost, $3,500.

Denver, Col.

Church. — English Lutheran church and parsonage, California St.; cost, $11,000; Varian & Sterner, architects.

Schoolhouses. — Delgany Public School; cost, $7,500; R. S. Roeschlaub, architect.

Fleming's Grove School, brick building, one-st'y; cost, $4,500; Fred. Hale, architect.

Storehouse. — Colorado Fuel Co., 60' x 200'; cost, $9,000.

Stores. — G. W. Clayton, three-st'y stone business block, Lawrence St.; cost, $60,000; Edbrooke & Co., architects.

C. T. Chever, three-st'y business block; cost, $8,000.

Thos. Walch, three-st'y business block, Arapahoe St.; cost, $14,000; Edbrooke & Co., architects.

Houses. — Mrs. H. B. Gilbert, two-st'y brick dwell., Clarkson St.; cost, $6,500; Fred. Hale, architect.

J. S. Dreyfuss, two-st'y brick dwell., Curtis St.; cost, $6,000; Varian & Sterner, architects.

Mrs. J. Dickinson, two-st'y brick dwell.; cost, $5,000.

H. Bennett, two-st'y brick dwell., Stout St.; cost, $8,000; Wm. Quayle, architect.

J. B. Keilson, two-st'y brick block; cost, $3,000.

H. C. Brown, 2 two-st'y brick dwells., Lincoln Ave.; cost, $6,000.

Detroit.

Hotel. — The Cass Estate will rebuild the Cass Hotel, cor. Third and Woodbridge Sts.; cost, about $100,000; G. W. Lloyd, architect.

Building Permits. — Topping & Fisher, for W. Murphy, two-st'y brick dwell., 35 Putnam Ave.; cost, $15,000.

John W. Flinn, two-st'y brick dwell., 127 Henry St.; cost, $8,000.

Thomas Payne, two st'y brick dwell., 735 Second St.; cost, $9,000.

Jeynes & Son, two-st'y brick dwell., 702 Woodward Ave.; cost, $8,000.

S. J. Martin, two-st'y brick dwell., 557 Third St.; cost, $3,500.

A. Williamson, 3 two-st'y brick dwells., 111, 113 and 115 Porter St.; cost, $3,500.

P. Blindburg, two-st'y brick dwell., 66 Fremont St.; cost, $4,500.

Mrs. Jane E. Chamberlain, two-st'y double brick dwell., 43 West Willis Ave.; cost, $9,000.

W. H. Hollands & Son, 2 two-st'y brick dwells., 72 and 74 East High St.; cost, $8,000.

W. H. Hollands & Son, two-st'y double brick dwell., 57 and 59 East Warren Ave.; cost, $7,500.

S. J. Martin, 3 two-st'y brick dwells., 551, 553 and 555 Third St.; cost, $9,000.

Kansas City, Mo.

Building Permits. — W. W. Macfarland, brick building, s e cor. Fourth and Locust Sts.; cost, $7,000.

J. S. Weber, brick building, Southwest Boulevard; cost, $3,500.

J. S. Weber, brick building, Penn St.; cost, $3,000.

W. C. McKay, brick building, Forrest Ave.; cost, $6,000.

G. R. Meyer, brick building, n e cor. Krey and Independence Ave.; cost, $13,000.

S. A. Butler, brick building, n e cor. Fifteenth and Campbell Sts.; cost, $20,000.

P. E. Emery, frame building, West Fourteenth St.; cost, $1,500.

J. F. Corle, frame building, Santa Fe St.; cost, $27,000.

Berean Baptist Church, frame building, Vine St.; cost, $3,000.

M. Kendall, frame building, Brooklyn St.; cost, $3,500.

Frank Elmar, Linden and Third Sts.; cost, $4,700.

Minneapolis, Minn.

Building Permits. — J. F. Collern, two-st'y brick veneer store and flat, n e cor. North Humbold and Sixth Aves.; cost, $7,000.

Jeremiah Spear, 2 two-and-one-half-st'y brick veneer dwells., s s Second St., between Tenth and Eleventh Aves.; cost, each, $4,500.

Herbert T. Bush, two-st'y wooden dwell. and barn, e s Park Ave., between East Twenty-sixth and East Twenty-seventh Sts., s; cost, $3,500.

Highland Park Presbyterian Church Society, one-st'y wooden church, n e cor. North Emerson and Twenty-first Aves., n; cost, $5,000.

Miss A. M. Henderson, two-st'y wooden dwell., n cor. First Ave. and Seventh St.; cost, $2,700.

Anderson Bros., two-st'y brick store and flat, s s Twentieth Ave., between Third and Fourth Sts., n; cost, $3,500.

J. G. Palmer, 2 two-st'y wooden dwells., Portland Ave., between East Nineteenth and East Twentieth Sts., s; cost, each, $3,500.

Wm. H. Groff, two-and-one-half-st'y wooden dwell., n w cor. East Twentieth St. and Second Ave.; cost, $10,000.

Gates Bros., two-and-one-half-st'y stone veneer addition to tenement, n s Grant St., between Willow St. and Spruce Pl., s; cost, $15,000.

Syndicate Co., alteration store building, e s Nicollet Ave., bet. Fifth and Sixth Sts., s; cost, $6,000.

Dickens & McCague, two-st'y brick livery stable, n s Fifth St., bet. Hennepin and First Aves., n; cost, $4,000.

Kerrick & Danforth, two-st'y wood dwell., s s Highland Ave., bet. Oak Lake addition; cost, $4,000.

Magnus Swanson, two-st'y wood dwell., w s Buchanan St., bet. Eighteenth and Eighteenth-and-a-half Aves., n; cost, $2,500.

Chicago, Milwaukee, Minneapolis & St. Paul R.R., one-st'y wood wheat storage-house, s s Eighth Ave., bet. Second and Washington Aves., s; cost, $5,700.

Chicago, Milwaukee, Minneapolis & St. Paul R.R., one-st'y wood wheat storage-house, s s Eighth Ave., bet. Washington Ave. and Third St., s; cost, $11,750.

F. H. Boardman, three-st'y brick veneer dwell., e cor. West Fifteenth St. and Oak Grove Ave.; cost, $10,000.

F. Wackmitte, two-st'y brick store, w cor. Seventh Ave. and Third St., n; cost, $5,000.

J. M. Miller, two-st'y stone veneer dwell., n w s Harmon Pl., bet. Maple St. and Hennepin Ave.; cost, $16,000.

Peter Lafgren, two-st'y brick veneer dwell., w s Fifteenth Ave., bet. Ninth and Thirteenth Sts.; cost, $7,000.

Carl Peterson, two-st'y wood dwell., w s Fifteenth Ave., bet. Ninth and Thirteenth Sts., s; cost, $3,000.

Mrs. McGuire, two-st'y wood dwell., n e cor. Pleasant Ave. and Beacon St., s; cost, $3,300.

Rosa A. Wright, 3 three-st'y brick veneer dwells., s s Eighth St., bet. Third and Fourth Aves., s; cost, $10,000.

C. A. Pillsbury & Co., two-st'y wood storage-house, s s Seventh St., bet. Seventeenth and Eighteenth Sts., s; cost, $20,000.

Union Elevator Co., wood elevator, n e s St. Paul & Manitoba Railroad tracks; cost, $50,000.

New York.

The Outlook. — It is hardly likely that any large buildings will now be started before spring, and builders are very busy getting their work now under way, covered in before frost.

Flats. — At No. 225 Lexington Ave., five-st'y and basement, brick, brown-stone and terra-cotta flat, 26' x 78', to cost $25,000, is to be built for Mr. John E. O'Brien; from plans of Mr. Hugo Kafka.

Storage-House. — On the w s Second Ave., com. 53' n Thirty-seventh St., six-st'y brick and stone building, 74' 2½" x 96', first-st'y and basement for storage purposes, and above improved tenements is to be built for the Merchant's Storage and Warehouse Co., at a cost of about $45,000; from plans of Messrs. De Lemos & Cordes, who will also design for the same Company a five-st'y office-building, with tenements above on the n s Forty-seventh St., 188' w Second Ave., to cost $18,000.

Building Permits. — *East Eighty-sixth St.*, *No.* 342, 3 four-st'y and basement brick tenements, flat tin roofs; cost, $48,000; owner, James Barry, 342 East Eighty-sixth St.; architect, H. L. Harris, Ninth Ave., cor. Eightieth St.

West Eighty-seventh St., *Nos.* 403 *to* 407, 3 three-st'y and basement brick dwells., flat tin roofs; cost, $27,000; owner, J. M. Grenell, 1761 Broadway.

Norfolk St., *Nos.* 9 *and* 11, 2 five-st'y brick tenements, peak tin roofs; cost, $30,000; owner, Charles Schmidt, 9 and 11 Norfolk St.; architect, Frederick Ebling, 140 Second St.

Eighty-fifth St., n s, 100' e Ninth Ave., 14 four-st'y and basement brick dwells., mansard roofs; cost, $200,000; owner, Stephen C. Clark, guardian, Alf Corning Clark; architect, Geo. H. Griebel, 16 West Twenty-fourth St.

East Twenty-fourth St., *Nos.* 325 *and* 327, 2 five-st'y brick tenements, flat tin roofs; cost, $32,000; owner, Frederick Heerlein, 932 Second Ave.; architect, Frederick Ebling, 140 Second St.

Sixth Ave., s w cor. One Hundred and Twenty-fourth St., four-st'y brick tenement, flat tin roof; cost, $18,000; owner, Joseph Bierhoff, 276 West One Hundred and Twenty-seventh St.; architect, Theo. E. Thompson, n e cor. Eighth Ave. and One Hundred and Twenty-fifth St.

East Nineteenth St., *No.* 7, five-st'y brick store building, flat tin roof; cost, $25,000; owner, Robert Carter, 61 Broadway; architect, Thomas R. Jackson, 61 Broadway.

Broadway, e s, 27' s One Hundred and Thirty-first St., four-st'y brick tenement, flat tin roof; cost, $7,000; owner, Sarah Myers, 211 West Twenty-second St.; architect, E. T. Hatch, One Hundred and Thirty-first St., cor. Broadway.

Broadway, e s, 55' s One Hundred and Thirty-first St., four-st'y and basement tenement, flat tin roof; cost, $9,000; owner, Sarah Myers, 211 West Twenty-second St.; architect, E. T. Hatch, One Hundred and Thirty-first St., cor. Broadway.

Broadway, e s 71' s One Hundred and Thirty-first St., five-st'y brick tenement, flat tin roof; owner, Sarah Meyers, 211 West Twenty-second St.; architect, E. T. Hatch, One Hundred and Thirty-first St., cor. Broadway.

Fifty-eighth St., s s, 25' w Ninth Ave., 3 five-st'y brick tenements, brown-stone front, flat tin roofs; cost, $66,000; owner, Bernard Wilson, 337 East Fifty-eighth St.; architects, Thom & Wilson, 1267 Broadway.

Forty-eighth St., n s, 175' w Ninth Ave., five-st'y brick tenement, flat tin roof; cost, $19,000; owner, Alexander Moore, 453 West Forty-eighth St.; architect, Louis Ungrich, 1554 Broadway.

Fifty-eighth St., s w cor. Ninth Ave., five-st'y brick tenement, flat tin roof; cost, $25,000; owner, Bernard Wilson, 337 East Fifty-eighth St.; architects, Thom & Wilson, 1267 Broadway.

East Eightieth St., *No.* 503, two-st'y brick office, flat tin roof; cost, $5,000; owner, James H. Ferdon, 204 East Seventy-seventh St.; architect, John Westervelt, 1563 Third Ave.

Forty-eighth St., n s, 350' w Eleventh Ave., 4 five-st'y brick tenements, flat tin roofs; cost, $54,000; owner, Andrew T. Doyle, 351 East Fifty-eighth St.; architects, A. B. Ogden & Son, 409 East Fifty-third St.

West Fifty-first St., *Nos.* 540 *and* 542, 2 five-st'y brick tenements, flat tin roofs, brown-stone front; cost, $40,000; owners, Huston Bros., 542 West Fifty-first St.; architect, C. Abbott French, 200 West Fifty-eighth St.

Norfolk St., *No.* 122, five-st'y brick tenement, flat tin roof; cost, $18,000; owner, S. Bachrach, s e cor. Grand and Norfolk Sts.; architect, Chas. Rentz, 80 Greenwich Ave.

Norfolk St., *No.* 105, five-st'y brick tenement, flat tin roof; cost, $18,000; owner and architect, same as last.

Ave. A, s e cor. One Hundred and Fifteenth St., five-st'y brick tenement, flat tin roof; cost, $18,500; owners, Mrs. Christina Hanschen, 117 West Twenty-fourth St., and J. Edward Dresseler, 500 East Eighty-first St.; architect, Edward L. Angell, 40 Broadway.

One Hundred and Twenty-second St., n s, 100' w Seventh Ave., 3 three-st'y brick dwells., flat tin roofs; cost, $38,000; owner, Phœbe Smith, 1475 Broadway; architect, Geo. B. Pelham, 56 Wall St.

One Hundred and Fifty-fifth St., n s, 225' e Eleventh Ave., two-st'y wooden athenæum, shingle and tin roof; cost, $6,000; owner, Joseph W. Cain, 1629 Broadway; architect, W. M. Grinnell, 121 East Twenty-third St.

Washington St., *Nos.* 415, 417 *and* 419, seven-st'y brick warehouse, flat tin roof; cost, $35,000; owner, Jas. Pyle, 215 West Forty-fifth St.; architect, Thos. R. Jackson 61 Broadway.

Tenth Ave., *Nos.* 507 *and* 509, 2 five-st'y brick tenements, brown-stone fronts, flat tin roofs; cost, $20,000; owner, Joseph Schwarzler, 1365 Fifth Ave.; architects, Wilson & Hudson, 490 Sixth Ave.

One Hundred and Sixty-fourth St., n s, 125' e Boston Ave., 5 two-st'y frame dwells., flat tin roofs; cost, $15,000; owner, Silas D. Gifford, One Hundred and Sixty-seventh St.; architect, John E. Kirby, 15 Broadway.

Market St., *No.* 11, four-st'y brick tailor-manufactory, flat tin roof; cost, $4,500; owner, Morris Alexander, 97 East Broadway; architect, Frederick Wandette, 171 Suffolk St.

East Broadway, *No.* 126, five-st'y brick tenement, flat tin roof; cost, $14,000; owner, Edward D. Conolly, 675 Lexington Ave.; architects, Renwick, Aspinwall & Russell, 71 Broadway.

One Hundred and Fifty-seventh St., s s, 250' w Tenth Ave., 3 three-st'y wooden dwells., flat tin roof; cost, $12,000; owner, E. R. Fay, Tenth Ave. and One Hundred and Fifty-eighth St.; architect, Henry Fouchaux, Tenth Ave. and One Hundred and Fifty-eighth St.

Alterations. — *Cedar St.*, *No.* 117, three-and-a-half-st'y brick tenement, alterations; cost, $4,500; owner, Thos. Cleary, 120 Broadway.

West Fifteenth St., *Nos.* 540 *and* 542, two-st'y brick whiteuing-mill, extension; cost, $6,000; owner, Thomas Lennon, 542 West Fifty-seventh St.; architects, Schwarzman & Buchman, *Tribune* Building.

Greenwich St., *No.* 187, three-st'y brick and brown-stone bank and office-building, alterations; cost; $4,000; owner, North River Bank, 187 Greenwich St., architects, Alfred Zucker & Co., 346 Broadway.

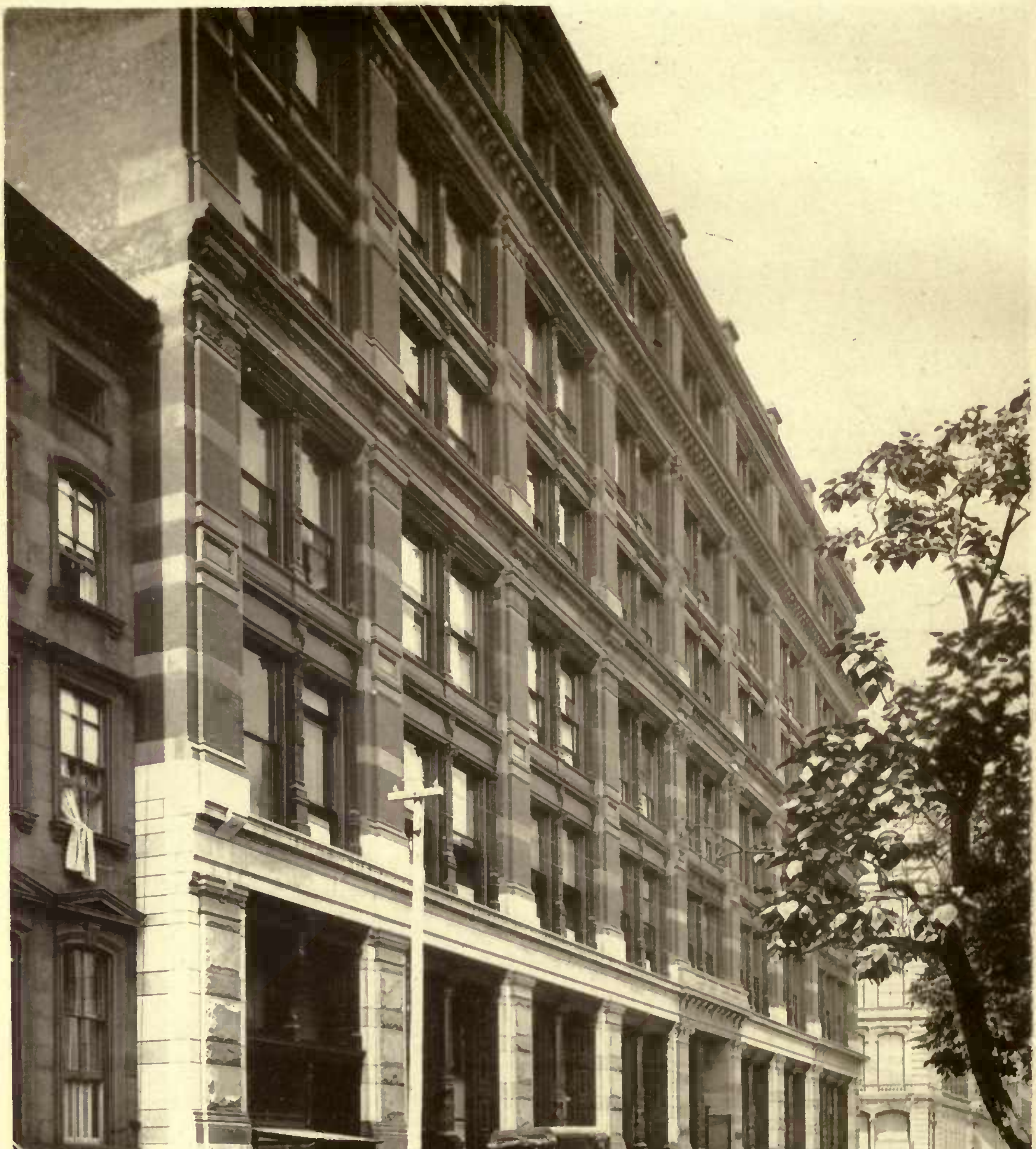


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W. WHEELER SMITH, Architect.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 518.

NOVEMBER 28, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE St. Louis *Republican* gives the only full account which has yet reached us of the proceedings of the Convention of the Western Association of Architects, which met in St. Louis on Wednesday of last week. The account, by the way, is a model one, containing not only verbatim reports of the addresses, and even of portions of the discussions, but clever little portraits of many of the principal members of the Convention. The attendance, though not so great as had been hoped, was very satisfactory, ninety delegates being present, from nearly every western and southwestern State, and including a large proportion of the best-known architects of the country. The first business of the Convention, after the delivery of the opening addresses, which we shall have the pleasure of presenting in full later, was the election of new members. One hundred and ten names were proposed, with the recommendation of the standing Board of Directors, and their owners were duly elected to membership. One of the applicants was a lady, Mrs. Louise Bethune of Buffalo, New York. This lady and her husband practise the profession of architecture together, and, although her application was reserved for special consideration, she was elected by a unanimous vote. After these formalities a report of great importance was presented by Mr. Burnham, the Chairman of the Committee on Competitions. This committee, as Mr. Burnham said, was "convinced that the subject of competitions was the most important question which confronts the profession, and that its consideration should take precedence of everything else until a satisfactory solution had been reached," and seems to have made a serious and conscientious effort to do something to mitigate at once the evils of the present system of conducting such contests. In substance, its plan appears to be nearly the same as that which is quietly but surely doing its good work in England; but the Western Committee devoted its attention rather to the promoters of competitions than to the architects, presenting a code for the management of competitions which far surpasses, in the practical thoroughness with which it provides for all the points which need to be regarded, anything of the kind which we have yet seen. We shall publish this as one of the most valuable documents presented at the Convention, and commend it to the study, not only of architects, but of laymen who wish to understand how competitions can be carried out in a manner perfectly satisfactory to all parties concerned. In deciding to give prominence to a careful code of competition, rather than to a mutual agreement in the profession, with a very short code of competition for a basis, as is the English plan, the committee reflected that agreements among architects alone were likely to be loosely observed; forgetting, perhaps, that a copy of the agreement in regard to competitions, *with a list of the names of the fifteen hundred architects who have signed it*, is, in England, sent by a special secretary to all building committees and other persons likely to invite competitive designs for anything. It proposed, however, to arrive at the same result, by urging architects to sign a pledge to abstain from all competitions in which the essential features of the code should not be regarded, and the two schemes for reforming the abuses of the present system may be regarded as substantially complementary of each other.

THE code, as presented by the committee, was adopted with slight amendment. Whether the proposition to invite the members of the Convention to pledge themselves individually to support it was carried out, we do not learn, but cannot doubt that the experienced and earnest committee which prepared it will see that the movement is not allowed to stop short of complete success. The next business in order was the discussion of a bill for establishing a National Building Bureau, reported by the committee appointed for the purpose. As presented, the committee's draught proposes very much the same changes in the methods of carrying out public works as the modification of the Stockslager bill prepared by the committee of the American Institute of Architects, and was approved and adopted by the Convention as to its general features, and referred to a special committee of three, which was empowered to consult with the officers of the American Institute of Architects, and make such changes as might be deemed advisable, with the object of securing the coöperation of the American Institute in the effort to secure the enactment of a bill representing the opinion of the profession throughout the country. The Convention then considered the subject of State laws regulating the practice of architecture, and referred it to a standing committee on State Associations, consisting of one member from each State represented in the Association. After the transaction of some business of less general interest, and the election of Mr. Adler of Chicago as President, Mr. Root of Chicago as Secretary, and Mr. Treat of the same city as Treasurer, with Messrs. Jenney of Chicago, Illsley of St. Louis, Taylor of Des Moines, Sidney Smith of Omaha, and Millard of St. Paul as members of the Board of Directors, the Convention adjourned, to meet in Chicago next year.

A GOOD deal of dissatisfaction has been expressed by real-estate owners and agents in New York at a recent decision of a court in that city. It seems that several families, who occupied flats in an apartment-house in a fashionable quarter of the town, had suffered from the effects of what they suspected to be the escape of sewer-gas into their rooms. They held their apartments on leases, but becoming convinced that sewer-gas came into their apartments through defects in the plumbing, they were prudent enough to abandon their homes at once, without waiting until the atmospheric poison had produced more serious effects. This proceeding, although in our opinion highly commendable, did not meet with the approbation of the landlord, who demanded from the fugitives the amount of their rent for the unexpired portion of the term of their leases. They refused to pay it, and were forthwith cited before the court, to show cause why they should not do so. They presented their case at length, and brought satisfactory evidence to show that sewer-gas did actually escape into their rooms from the plumbing pipes, and that they and their families suffered in health in consequence; and the judge decided that this was a sufficient reason for the termination of their lease, and of the rights of the landlord over them, and ordered the latter's claim to be dismissed. The persons who criticise this decision, which they do in very vigorous language, argue that tenants on lease, who find better houses elsewhere at a lower price, or for some other reason desire to get rid of their obligations, are likely either to imagine that they smell sewer-gas in their rooms, or to reduce their suspicions to a certainty by drilling holes in the soil-pipes; so that landlords will be at the mercy of their tenants. The obvious answer to this is that the official inspectors of the Board of Health will at any time, on the request either of the landlord or the tenant, examine the premises and make a formal report of the condition of the plumbing and drains; but some of the discontented ones object again that the Board of Health inspectors are careless or ignorant, or prejudiced, and that their report would be of little service to the landlord; while others expand this complaint into a general denunciation of the "oppressions" practised by the Board of Health upon the unfortunate landlords. If all the assertions upon which the landlords and real-estate agents base their arguments were correct, there would be some ground for sympathizing with them, but it is due to the New York Board of Health and its inspectors to say that very little evidence can

be produced in support of them. The so-called "oppressions" of the Board have been, as we believe, invariably practised for the defence of helpless or unsuspecting persons against the neglect or indifference of those who ought to have done their duty without official urging; and we know that its orders represent the conclusions arrived at after careful and intelligent study of the cases to which they apply, guided by a thorough familiarity with the branches of sanitary science which apply to them. That inspectors so faithful as those who honor their profession in New York would ignorantly or wilfully pervert the truth in an official report, for the interest either of landlord or tenant, is very unlikely; and without such justification as would be shown by the inspector's report no court would support a tenant in avoiding his obligations.

THE *Fireman's Journal* tells a curious story of a dispute which has arisen between two New Jersey towns, and is to be taken to the courts, where it is likely to become, as a precedent, one of the most important cases ever tried in this country. It seems that the two towns in question, Asbury Park and Ocean Grove, are situated near each other, although they do not, as we understand, actually adjoin each other. The Ocean Grove Camp Meeting Association, which practically controls the town, drove an artesian well two or three years ago on its own land. The well is six hundred feet deep, and furnished a supply of fifty gallons of water a minute, throwing it to a height of twenty-eight feet above the ground. This well supplies all the water used in the town, which lies close to the sea, and sixty thousand dollars have been spent in laying pipes to carry it through the streets. More recently, Asbury Park, which had been supplied by ordinary wells, decided to obtain a public water service, and began driving artesian wells. Four or five were sunk within the town boundaries, but for some reason, they were considered insufficient or unsatisfactory, and two weeks ago another was driven half a mile outside of the corporate limits of the town, and within four hundred feet of the well which constitutes the sole supply of the Ocean Grove people. The driving of the second well immediately and very seriously affected the first, reducing the flow from fifty gallons a minute to thirty, and the head to eight feet in place of twenty-eight. The Ocean Grove people, finding not only that the water would no longer flow into the second story of their houses, but that they would not have enough left for their bare necessities, appealed to the town authorities of Asbury Park, who, however, replied that "they had no proposition to offer" to their neighbors in regard to the loss they had inflicted on them; and an appeal was then made to the law. Although we know of no case exactly like this which has been decided in the courts, we are inclined to think, from the analogy of somewhat similar recent ones, that the Ocean Grove people will win in the controversy. There is no doubt that the underground water is in some degree common property; but a person who goes to the trouble and expense of driving a well six hundred feet deep to collect some of the water acquires a certain right to carry on his operations of collection undisturbed; and the driving of another well within a distance of the previous one less than its own depth seems to be an intrusion upon the legitimate collecting ground of the first well which nothing but absolute necessity could excuse.

"*BUILDING*," the excellent architectural monthly published by Mr. Wm. T. Comstock of New York, is, we learn, to begin the next year as a weekly, under the editorial charge of Mr. Wm. Paul Gerhard, a distinguished sanitary engineer, and the author of several of the most useful popular works on sanitary matters ever published. We wish Mr. Gerhard and Mr. Comstock success in their undertaking, and as neither of them, to our knowledge, have yet tried to do anything which was not thoroughly well done, we cannot doubt that they will meet with due reward.

TWO or three years ago it was reported that a fire had broken out in the cellars of the picture-galleries of the Louvre, through some error in the arrangement of the heating-apparatus, and that, although the matter was hushed up as far as possible, the priceless collections stored in the building were for a time in much danger. Quite recently another alarm has been raised by the Paris newspapers, not on account of an actual fire, but by reason of the carelessness which was said to prevail in storing the wood used for supplying the open fires in the various rooms. The editor of *La Semaine des Constructeurs*, thinking this a matter of considerable importance, wrote to M. Guillaume, the architect in charge of the building, to learn the truth, and received a reply which is certainly quite reassuring. In regard to the storage of wood in the upper stories, M. Guillaume acknowledges that objectionable practices existed for a time, apparently from the impossibility of finding room for wood in the basement, which was filled with fragments of marble, casts and moulds; but he says that during the summer space enough has been cleared of these objects to accommodate a supply of fire-wood, and two dumb-waiters have been constructed to convey to each story the quantity needed for each days' consumption. With respect to the assertion that fires have already occurred in the building, and that many families live in the upper stories, increasing, by the probability of mishaps incidental to housekeeping, the risks to which the building is exposed, M. Guillaume says that in the days of M. Barbet de Jouy, the former director, who had to defend the treasures of the palace against the Commune, a considerable number of persons were attached to the building; but this is changed under the present administration, and no one now lives in the Louvre but the director, the cashier, the inspector of the building, the night watchmen, a gas-fitter, a plumber and a "fumiste," or expert in flues and fireplaces. All these have their lodgings in fireproof rooms, in a separate part of the building. As an additional precaution against fire, the Louvre is provided with the most thorough system of water-service yet placed in any building in Paris. This was introduced by M. Lefuel, the late architect in charge, who arranged a line of pipes entirely around each story, with hydrants at many points, the whole work costing more than forty thousand dollars. One of the plumbers who carried out the work is permanently employed to take charge of it, and under his direction the watchmen are regularly drilled in the manœuvres necessary for extinguishing fires promptly.

MOST of our readers have probably heard of the rediscovery, in Algeria, of the quarries from which many of the most beautiful antique marbles were obtained. The first discovery was rather in Tunis than Algeria, but on the railway from Bona to Tunis, near the Algerian frontier, where an extensive deposit of the lovely yellow marble, called giallo antico, and hitherto only known by the fragments obtained from various Roman ruins, was found two or three years ago. This quarry, which showed the traces of the operations of the Romans, was secured by a Belgian company, and is now regularly worked, not only for the giallo antico, but for a rose-colored marble and a brown breccia which are found in the same deposit. Within a few months another antique quarry has been found in the province of Oran, near the Mediterranean coast, covering some two thousand acres, and furnishing not only giallo antico, but various sorts of breccia and cipolino, besides black and white marble. This quarry has been acquired by an Italian, M. Delmonte, who, as *La Semaine des Constructeurs* informs us, has already built roads and commenced operations, and these precious marbles can be delivered on the wharf at Oran for about a dollar a cubic foot.

THE horticulturists who do so much to render summer railway travel agreeable in the more settled parts of the country by their ingenuity and taste in decorating the grounds about the stations may perhaps be interested to know that in the opinion of M. Cambier, chief roadmaster of the French Government railways, the best plant yet discovered for consolidating, by the interlacing of its roots, the loose soil of a newly made embankment is the double poppy. Ten years' trial has enabled M. Cambier, as he says, to guarantee that the poppy will be found far more efficient for this purpose than any of the grasses or clovers usually employed; and while these require several months for the development of their comparatively feeble roots, the double poppy germinates in a few days, and in two weeks grows enough to give some protection to the slope, while at the end of three or four months the roots, which are ten or twelve inches long, are found to have interlaced so as to retain the earth far more firmly than those of any grass or grain. Although the plant is an annual, it sows itself after the first year, and with a little care the bank is always in good condition. In France the double poppy is perfectly hardy, and can be sown at almost any time from March to November. With us it is also said to be quite hardy, and a long embankment covered through the later summer and autumn with the dazzling scarlet blossoms, contrasted with green grass at the foot of the slope, would have a most striking effect.

ADVICE TO STUDENTS.[1]



Modern Brass work from the Cabinet Maker and Art Furnisher.

THE object of this examination is to afford to all students of Architecture the opportunity of testing the extent and accuracy of their knowledge; to provide a curriculum of study for the acquisition of the knowledge required for the practice of the profession with some degree of credit; to ascertain that the candidate has acquired such *minimum* amount of knowledge; and to lay the foundation for and encourage the development of further study and independent thought.

To attain this end no mere perfunctory perusal of elementary or rudimentary works is sufficient. They may serve a useful purpose for the preliminary teaching of young pupils or of amateurs, but for the professional architect a more thorough course of study is indispensable.

This course should be systematically followed from the first entry of the pupil into an office, and he should first acquire a general knowledge of all styles before devoting himself to the special study of any one style in particular.

As a general foundation for the knowledge necessary to pass the examination in all its branches, a careful study of Gwilt's "*Encyclopædia*," which should be in the possession of every architectural student, will be found of great service; the student will there find almost all the subjects required dealt with concisely, but at sufficient length to form an admirable introduction to the detailed study of each, in the special text-books treating of it.

A list of the more notable of these books follows this, to which the attention of intending candidates is particularly directed. All the books therein named are accessible, in the Library of the Institute, to all *bonâ fide* candidates; many are in the Library of the Architectural Association, and are also to be found in most of the public libraries throughout the country, as well as being generally otherwise accessible. No difficulty should therefore arise in obtaining opportunities for the study of those works with which it is essential that the candidate should be well acquainted.

For the History of Architecture the earlier chapters of Gwilt, Mr. Fergusson's "*History;*" Gailhabaud's "*Monuments;*" Batissier's "*L'Art Monumental;*" Ramée's "*Histoire Générale,*" etc., should be supplemented by the Biographical Works of Milizia and Quatremère de Quincy, while, for those who have the opportunity, the lives of the architects treated of by Vasari will afford much instruction. The special text-books relating to each style will also afford detailed information to which that contained in the preceding works can only be considered as introductory; the more important of these text-books are mentioned in the succeeding paragraphs, the observations in which apply equally to this head of History.

Although each candidate will be expected to show a thorough acquaintance, graphic and historical, with the style and period selected by him, he will also be required to show a knowledge of the history and details of other styles.

As illustrating the range of knowledge which an architect should possess, under this head, it is only necessary to name a few of the principal monuments with the history and details of designs and construction of which he should be acquainted: — the Pyramids; the Parthenon; the Pantheon; St. Mark's, Venice; St. Peter's, Rome; St. Paul's, London; Sta. Maria, Florence; Sta. Sophia, Constantinople; Notre Dame, Paris; the Cathedrals of Canterbury, Salisbury, Lincoln, Rheims, Amiens, etc.; Westminster Abbey and the Temple Church, London; while the principal works of Brunelleschi, Bramante, Sansovino, San Michele, Palladio, Vignola, Inigo Jones, Wren, Chambers, and other great masters of the art, should be familiar to him.

In pursuing these studies a knowledge of modern languages will be found of essential service, and French, at the least, almost indispensable.

For the Characteristics of a Style careful study from an actual example is recommended; and if such building is not easily accessible to the student, one of which ample illustrations are available may be selected; but that the studies should be from the actual building is to be preferred.

For Mouldings, Features and Ornaments, in the special style selected by the candidate, acquaintance should be obtained by drawing, measuring and sketching from the actual building, aided by careful study of the more accessible of the standard works, a thorough acquaintance with which should be acquired.[2]

For Greek Architecture.—The study of Stuart and Revett's "*Antiquities of Athens;*" Wilkins's "*Magna Græcia;*" the Society of Dilettanti's "*Antiquities of Ionia and of Attica;*" Mr. Penrose's "*Athenian Architecture;*" and Cockerell's "*Ægina*" is indispensable.

For Roman Architecture. — A knowledge can be acquired from Taylor and Cresy's "*Antiquities of Rome;*" Adam's "*Spalatro;*" Wood and Dawkins's "*Palmyra*" and "*Balbec:*" from Palladio Canina, etc. The Orders are well shown in Mauch, Normand, Nicholson, Chambers and Gwilt; and Classic Ornament is shown in Vulliamy, Tatham, etc.

For Mediæval Architecture.—Reference should be made to Sharpe's "*Parallels;*" Pugin's "*Normandy;*" to Rickman; Bloxam; Paley's "*Mouldings;*" Brandon's "*Analysis;*" Colling's "*Details and Ornaments;*" and Viollet-le-Duc's "*Dictionnaire,*" at the least.

For Renaissance Architecture.—Of the History and of the Architects of this period every Candidate will be expected to have a knowledge which can be acquired from Letarouilly's "*Rome;*" Palladio; Grandjean and Famin's "*Toscane;*" Percier and Fontaine's "*Rome;*" and Cicognara's "*Venezia;*" while the careful perusal of Sir William Chambers's "*Treatise on the Decorative part of Civil Architecture*" should not on any account be omitted.

The Candidate must distinctly understand that he will be required to show a reasonable acquaintance with styles and periods other than that selected by him.

For Plan, Elevation, Section, etc. — The experience acquired in office practice may be, with advantage, supplemented by attendance at the Architectural School of the Royal Academy, the Classes of Design and Construction of the Architectural Association, and the classes of local societies.

For Materials and Construction the knowledge gained in office-work and inspection of buildings in progress should here be useful. The three volumes of "*Notes on Building Construction*" will be found of great value, in fact, indispensable; the "*Pocket-Books*" of Hurst and Young should be carefully studied; while Tredgold and Newland on "*Carpentry;*" Rankine's "*Manuals of Applied Mechanics and Civil Engineering;*" Stoney on "*Strains;*" Mr. Tarn's "*Science of Building;*" Stock's "*Shoring and Underpinning;*" and other technical works, may be studied with advantage. Applied Mathematics and Geometry may form part of the examination, and readiness of calculation and acquaintance with formulas and their application will be appreciated.

The construction of Floors and Roofs; methods of calculating the strength of timber, cast and wrought iron beams, and of other materials; the properties and qualities of building materials generally, and their applications, must be studied under this head.

For Sanitary Science a careful study of Parkes's "*Manual of Hygiene*" is indispensable; and for the practical details of drainage and plumbing the works of Mr. B. Latham, Mr. Bailey-Denton and Mr. Hellyer should be consulted.

For Specifications it should not be necessary for the candidate to refer to books, his experience in office-work should have supplied him with the necessary knowledge, but any deficiency therein may be to some extent made up by reference to Gwilt, Bartholomew, or Professor Donaldson; while for Measuring, the useful books of Dobson, Mr. Banister Fletcher and Mr. Leaning will give all necessary information.

The knowledge of professional practice in its legal aspects can be obtained from the useful hand-books of Messrs. Fletcher, Jenkins, Emden and Roscoe, to which, however, the student will in future years give more careful and detailed consideration than is at present essential.

The range of study thus indicated is only that with which an architect's pupil should, during his articles, have made himself generally acquainted, and in the course of further special study for a year or two should readily qualify himself to pass the examination creditably at about the age of twenty-three.

This course will open for him new sources of pleasure, lay the foundation of sound knowledge of his profession, and help to place him, as regards general knowledge thereof, at least on a level with those amateurs of a liberal education who have directed their attention to architecture; and however successfully the examination may be passed, the student must consider his success as only an inducement and introduction to further study, literary, artistic and practical.

The questions set in the Examination are carefully framed in order to elicit the general and special knowledge of the Candidate, all "trap" questions or those of a recondite or puzzling nature are avoided, and every endeavor is made to afford the Candidate the opportunity of displaying his knowledge — opportunities further increased by the Oral Examination which closes the proceedings, when the Candidate has the advantage of receiving the well-considered advice of the Board.

LIST OF SELECTED BOOKS FOR PROFESSIONAL REFERENCE AND STUDY.

HISTORY OF ARCHITECTURE. — GENERAL HISTORY AND BIOGRAPHY.

Batissier (L). Histoire de part monumental dans l'antiquité et au moyen âge. 8o. Paris, 1845.

Fergusson (J). Illustrated hand-book of architecture. 2 vols. 8o. London, 1855; History of the modern styles of architecture. 2d ed. 8o. London, 1873; History of architecture in all countries. 2d ed. 2 vols. 8o. London, 1874.

Freeman (E. A). History of architecture. 8o. London, 1849.

Gailhabaud (J). Monuments anciens et modernes. 4 vols. 4o. Paris, 1850.

Kugler (F). Geschichte der baukunst. 3 vols. 8o. Stuttgart, 1859.

Milizia (F). Lives of celebrated architects. Translated by Mrs. E. Cresy. 2 vols. 8o. London, 1826.

[1] Advice offered by the examiners to candidates desirous of entering for the examination of the Royal Institute of British Architects.

[2] The student may also with great advantage practise the sketching of details and features from memory, as the acquisition of such power is most desirable.

Quatremère de Quincy (A. C). Histoire de la vie et des ouvrages des plus célèbres architectes. 2 vols. 8o. Paris, 1830; Dictionnaire historique d'architecture. 2 vols. 4o. Paris, 1832.
Ramée (D). Histoire générale de l'architecture. 2 vols. 8o. Paris, 1870–72.
Vasari (G). Lives of the most eminent painters, sculptors and architects. Translated by Mrs. J. Foster. 5 vols. 8o. London, 1850.

CLASSICAL.

Adam (R). Ruins of the Palace of Diocletian at Spalatro. fo. London, 1764.
Barozzi da Vignola (G). Architecture. (Various editions).
Canina (L). L'architettura antica. 9 vols. fo. Rome, 1834–43; Gli edifizj di Roma antica. 6 vols. fo. Rome, 1848–56.
Cockerell (C. R). Temples at Ægina and Bassæ. fo. London, 1860.
Inwood (H. W). Erechtheion at Athens. fo. London, 1827.
Mauch (J. M). Neue systematische darstellung der architektonischen ordnungen. 4o. Potsdam, 1845.
Nicholson (P). Principles of architecture. 3 vols. 8o. London, 1795–98.
Normand (C). New parallel of the orders of architecture. Translated by A. Pugin. fo. London, 1829.
Palladio (A). Architecture. (Various editions).
Penrose (F. C). Principles of Athenian architecture. fo. London, 1851.
Society of Dilettanti. Antiquities of Ionia. 4 vols. fo. London, 1769–1881; Unedited antiquities of Attica. 2d ed. fo. London, 1833.
Stuart (J)., and Revett (N). Antiquities of Athens. 5 vols. fo. London, 1762–1830.
Taylor (G. L)., and Cresy (E). Architectural antiquities of Rome. 2d ed. fo. London, 1874.
Vitruvius, Pollio (M). Architecture. (Various editions).
Wilkins (W). Antiquities of Magna Græcia. fo. London, 1807.
Wood (R). Ruins of Palmyra. fo. London, 1753; Ruins of Balbec. fo. London, 1757.

BYZANTINE.

Couchaud (A). Choix d'églises Bysantines en Grèce. fo. Paris, 1842.
Hübsch (H). Monuments de l'architecture chrétienne. fo. Paris, 1866.
Salzenberg (W). Alt-christliche baudenkmale von Constantinopel, vom V, bis XII, jahrhundert. 2 vols. fo. Berlin, 1854.
Texier (C)., and Pullan (R. P). Byzantine architecture. fo. London, 1864.
Verneilh (F. de). L'architecture Byzantine en France. 4o. Paris, 1851.

MEDIÆVAL.

Bloxam (M. H). Principles of Gothic ecclesiastical architecture. 11th ed. 8o. London, 1882.
Bowman (H)., and Crowther (J. S). Churches of the Middle Ages. 2 vols. fo. London, n. d.
Brandon (R. and J. A). Analysis of Gothick architecture. 2 vols. 4o. London, 1849.
Caumont (A. de). L'architecture religieuse. 4th ed. 8o. Paris, 1859.
Dollman (F. T., and Jobbins (J. R). Analysis of ancient domestic architecture in Great Britain. 2 vols. 4o. London, 1861–63.
Gailhabaud (J). Architecture du Vme au XVIIme siècle, etc. 5 vols. Paris, 1858.
Johnson (R. J). Specimens of early French architecture. fo. Newcastle-on-Tyne, 1864.
King (T. H)., and Hill, (G. J). Study-book of mediæval and art. 4 vols. 4o. London, 1858–68.
Pugin (A). Architectural antiquities of Normandy. 4o. London, 1828.
Rickman (T). Attempt to discriminate the styles of architecture in England, etc. 7th ed., by J. H. Parker. 8o. Oxford and London, 1881.
Scott (G. G). Lectures on mediæval architecture. 2 vols. 8o. London, 1879.
Sharpe (E). Architectural parallels. 2 vols. fo. London, 1848.
Turner (T. H)., and Parker (J. H). Domestic architecture in England. 4 vols. 8o. London, 1851–59.
Verdier (A)., and Cattois (F). Architecture civile et domestique, etc. 2 vols. 4o. Paris, 1855–57.
Viollet-le-Duc (E. E). Dictionnaire raisonné de l'architecture Française. 10 vols. 8o. Paris, 1854–68.

RENAISSANCE.

Berty (A). La renaissance monumentale en France. 2 vols. 4o. Paris, 1864.
Cicognara (L)., Diedo (A)., and Selva (G). Le fabbriche e i monumenti di Venezia. 2d ed. 2 vols. Venice, 1838–40.
Grandjean de Montigny (A). and Famin (A). Architecture Toscane. fo. Paris, 1875.
Letarouilly (P). Edifices de Rome moderne. 3 vols. fo. Paris, 1840–60.
Percier (C). and Fontaine (P. F. L). Palais, maisons, etc., à Rome. fo. Paris, 1830.
Sauvageot (C). Palais, châteaux, hôtels, et maisons de France du XVme au XVIIIme siècle. 4 vols. fo. Paris, 1867.

ENCYCLOPÆDIAS, GLOSSARIES, ETC.

Architectural Publication Society. Dictionary of architecture. (In progress). A-Q. 4o. London, ——
Gwilt (J). Encyclopædia of architecture. Edited by W. Papworth. 8o. London, 1876.
Parker (J. H). Glossary of terms used in architecture. 5th ed. 3 vols. 8o. Oxford, 1850.
Weale (J). Series of rudimentary treatises (various). 12o. London, v. d.

MOULDINGS AND ORNAMENTS.—CLASSICAL.

Chambers (W). Treatise on the decorative part of civil architecture. (Various editions).
Tatham (C. H). Etchings. fo. London, 1826.
Vulliamy (L). Examples of ornamental sculpture in architecture. fo. London, 1825.

RENAISSANCE.

Albertolli (G). Alcune decorazioni di nobili sale, etc. fo. Milan, 1781; Corso elementare di ornamenti architettonici. fo. Milan, 1805.

MEDIÆVAL (GOTHIC AND BYZANTINE).

Colling (J. K). Gothic ornaments. 2 vols. 4o. London, [1848–50]; Details of Gothic architecture. 2 vols. 4o. London, 1852–56.
Heideloff and Görgel. Architectural ornaments (English text). 4o. Nüremb. [1847].
Paley (F. A). Manual of Gothic mouldings. 3d ed., by Fawcett. 8o. London, 1865.
Sharpe (E). Supplement to "Architectural parallels." fo. London, 1848; The mouldings of the six periods of British architecture. 4o. London, 1877.

SANITARY SCIENCE.

Bailey-Denton (E. B). House sanitation. 8o. London, 1882.
Corfield (W. H). Water-supply, sewerage and sewage utilization. fo. Chatham, 1874.
Denton (J. B). Sanitary engineering. 8o. London, 1877.
Hellyer (S. S). The plumber and sanitary houses. 8o. London, 1877; Lectures on the science and art of sanitary plumbing. 8o. London, 1882.
Latham (B). Sanitary engineering. 2d ed. 8o. London, 1878.
Parkes (E. A). Manual of practical hygiene. Edited by Dr. de Chaumont. 6th ed. 8o. London, 1883.
Teale (T. P). Dangers to health. 8o. London, 1879.

MATERIALS AND CONSTRUCTION.

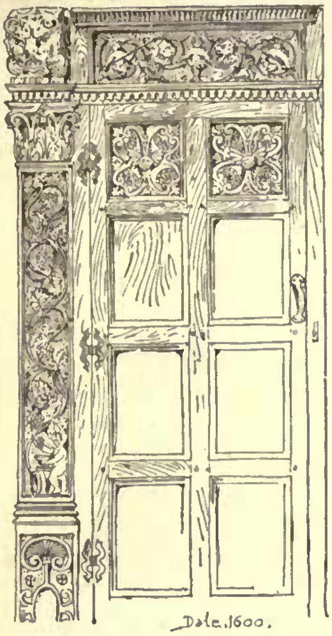
Ashpitel (A). Treatise on architecture, including the arts of construction, etc. 4o. Edinburgh, 1867.
Building Construction. Notes on building construction. 3 vols. 8o. Rivingtons: London, Oxford and Cambridge, 1875–79.
Fairbairn (W). Application of cast and wrought iron to building purposes. 4th ed. 8o. London, 1870.
Hodgkinson (E). Experimental researches on the strength and other properties of cast-iron. 8o. London, 1846.
Humber (W). Handy-book for the calculation of strains in girders, etc. 12o. London, 1880.
Moseley (H). Mechanical principles of engineering and architecture. 2d ed. 8o. London, 1855.
Newlands (J). The carpenter and joiner's assistant. 2 vols. 4o. London, 1860.
Rankine (W. J. M). Manual of applied mechanics. 4th ed. 8o. London, 1868; Manual of civil engineering. 6th ed. 8o. London, 1869.
Robson (G). Modern domestic building construction. fo. London, 1876.
Rondelet (J). L'art de bâtir. 4o. Paris, 1812.
Seddon (H. C). Building trades and building construction. 2d ed. fo. Chatham, 1877.
Stock (C. H). Shoring and underpinning. 8o. London, 1882.
Stoney (B. B). The theory of strains in girders, etc. 2 vols. 2d ed. 8o. London, 1869.
Tarn (E. W). The science of building. 8o. London, 1870.
Tredgold (T). Elementary principles of carpentry. 4th ed., by Barlow. 4o. London, 1853.
——————— revised by J. T. Hurst. 8o. London, 1880.
Ware (S). Tracts on vaults and bridges. 8o. London, 1822.

SPECIFICATIONS AND PROFESSIONAL PRACTICE.

Bartholomew (A). Specifications for practical architecture. 2d ed. 8o. London, 1846.
Dobson (E)., and Tarn (E. W). Student's guide to measuring, etc. 8o. London, 1871.
Donaldson (T. L)., and Glen (W. C). Handbook of specifications. 2 vols. 8o. London, 1859.
Emden (A). Building leases and building contracts. 8o. London, 1882; Metropolis management and building acts amendment, act 1882. 8o. London, 1882.
Fletcher (B). Metropolitan building acts, 1855–82. 8o. London, 1882; Dilapidations. 8o. London, 1872; Arbitrations. 8o.

London, 1875; Quantities. 2d ed. 8o. London, 1879; Light and air. 8o. London, 1879.
Jenkins (E)., and Raymond (J). Building contracts. 8o. London, 1873; The architect's legal handbook. 3d ed. 8o. London, 1880.
Leaning (J). Quantity surveying. 8o. London, 1880.
Local Government Board. Knight's annotated model by-laws. 8o. London, 1883.
Noble (J). Professional practice of architects, etc. 8o. London, 1836.
Roscoe (E. S). Digest of building cases, and addendum. 8o. London, 1879–80.

FIFTY-SIXTH ANNUAL EXHIBITION AT THE PENNSYLVANIA ACADEMY.



Portion of Panelling of a room from an old House: Exeter: Eng'd

THE differences between the Academy and the Society of Artists having been adjusted to the satisfaction of all parties, the current exhibition is more interesting than any of its three or four predecessors have been, not only because the local artists have very generally contributed, and sent their best work, but because their influence with the profession at large has served to attract to the Academy's walls a great deal of work which would otherwise either not have come to Philadelphia at all, or coming would have had to be shown in the separate and smaller exhibition which the Society has been accustomed to hold in the little gallery on Chestnut Street.

But the clans are happily united now, and peace and as much prosperity as art is accustomed to in Philadelphia have taken the place of discord and disaster. The Academy directors have simply turned over the whole business of holding the exhibitions to the artistic fraternity, about the only prerogative which they reserve for themselves, being the right to foot the bills.

The committee which has charge of the present exhibition consists entirely of resident artists appointed by the directors—amongst whom, as everybody knows there are no artists — but those to come in the future are to be managed by a committee chosen by a vote of the exhibitors at the one immediately preceding. The exhibitors this year electing those who are to serve next year, and so on. It remains to be seen whether such purely professional management will give any better satisfaction than the conduct of the laymen. For one thing, the hanging this year is not as bad as it has been sometimes, although it is by no means above criticism.

The most interesting picture in the collection, from the artist's point of view, is undoubtedly Mr. Alexander Harrison's "Bord du Mer," which attracted a great deal of attention at the last *Salon*, where it received an honorable mention. The committee is perhaps to be excused on the score of size for hanging it in a corridor, where it is hardly possible to see it, because it really is larger than there is any need of, but they would have added materially to the appearance of the galleries, if they had given it the place of honor at the end of the principal one, which has been accorded to Charles Sprague Pearce's "Peines de Cœur," a very nicely painted, but by no means remarkable picture of two French peasant women sitting on a green bank in the midst of a very simple and colorless landscape.

Mr. Harrison's picture shows a hollow between lows and hills which lie just back from the beach, and between them you see the sea beyond. Some boys are seen bathing in the surf; two are undressing in the foreground, and another, already disrobed, is eagerly running to join his comrades in the water. The interest of the subject centers in the energy of these boys, which is rendered with the same spirit which has always characterized Mr. Harrison's painting of this class of subject, one of which he seems to be especially fond, and in which he has done his best work. His "Castles in Spain," painted three or four years ago, is perhaps his most successful work, and it might have been painted from one of these same boys lying on his back in this very sand. The sympathetic spirit in which the boyish element was treated, is to me a very attractive thing in this picture, as it is in the other one; but of course nobody dares to say anything about the subject now-a-days, since nobody regards anything but purely technical qualities as deserving of any notice, and indeed it is as a piece of painting pure and simple that the picture makes its chief appeal. The strong thing about it is its breadth; the figures are solid and well modelled, and the quality of the soft sand is rendered with exquisite truthfulness; the shadow under the sand hills, and the sunshine beyond them are given with admirable force, but all is done within so narrow a scale that the whole picture—which is for the most part in shadow—fairly swims in light, the diffused light of the sea with its white shore.

The Temple gold medal has been awarded to Mr. Pearce, for the picture already mentioned, and the silver medal to Mr. W. T. Richards, for a rather large and strictly orthodox marine, with Bryant's sounding line, "old ocean's gray and melancholy waste" for a title. It is learnedly accurate as to its wave and cloud forms, of course, and very delicately painted, as all Mr. Richards's work is.

This matter of prizes has come to be one of no inconsiderable importance at the exhibitions of the Pennsylvania Academy. There are no more three-thousand-dollar prizes for historical painting, it is true (poor Trego's case, by the way, which has been dragging along in the courts for nearly two years, was finally decided against him the other day), but the two medals still find "takers" every year: and there is the Mary Smith Prize, of two hundred dollars, for the best picture by a resident lady artist, and two Toppan prizes, of two hundred and one hundred dollars respectively, which are given to students of the Academy schools. The Mary Smith prize goes this year to Miss Cecilia Beaux's portrait-group of a mother and child, which she calls "The Last Days of Infancy," and which is one of the most conspicuous successes of the exhibition.

Miss Margaret W. Lesley deserves mention as the only one who can be said to have seriously competed with Miss Beaux for this prize. Miss Sartain's portrait of Frederic Fraley, Esq., is a good strong work, but she was out of the race, having received this prize twice already, and Miss Mary K. Trotter's picture of a Breton peasant girl, although a work of undoubted merit, is too plainly an affair of temporary foreign influences to divide the honors with a work of so much native simplicity as Miss Beaux's portrait. For that matter, however, the pictures by Mr. Pearce and Mr. Harrison are just as much foreign work as the one just mentioned, and have just as little in common with American ideas.

It is very sad, of course, but it is true all the same, that as the years go by, the men from whose foreign training it was hoped that American art would gain so much, have, instead of recruiting native art with ideas gathered abroad, only grown more confirmed as foreigners themselves.

In addition to those already named, there are French pictures here by Bridgman, Clifford P. Grayson, Miss Ellen K. Baker, Kenneth R. Crawford, D. Ridgway Knight, Walter Gay, and a good many others, but very few by men who have studied for any length of time in foreign schools which treat of native themes, or which are painted with anything like the directness and simplicity to be found in the best work which has been painted here at home.

Mr. Hovenden is one of the few. His "And the Harbor Bar is moaning" is not exactly American in subject, it is true; but the work is so manly and frank and makes so little parade of cleverness that one gathers comfort from the assurance which it gives that it is still possible to be taught, without being spoiled by the schools of Paris.

Mr. Henry R. Poore is also, if I am not very much mistaken, a man who has profited by French teaching without being spoiled by it. His "Ulysse simulant la folie" is a schoolboy's exercise, a very brilliant one, it is true, but still an exercise; but the same artist's "Baying Hounds," while indicating decided genius in technical qualities over his earlier work is still as simple and unaffected as any of them. I wish I could say as much for Walter Gay's "Les fileuses," which is dry and uninteresting, in spite of the easy way in which it is painted, and notwithstanding the honorable mention which it received at the *Salon*. It is perhaps just as well that the Paris contingent is by no means as numerous or as conspicuous as it has been at some former exhibitions at this institution, and while it is certainly to be regretted that we cannot have — as we used to have here — an opportunity to see together the best part of the year's work of those who are working abroad, it gives, perhaps, a fairer idea of the progress which American art is making, to see an exhibition like this, in which the foreign work, good as most of it undoubtedly is, by no means monopolizes the interest of the occasion.

It is significant of an important change from old-time methods of American painters that comparatively few landscapes are exhibited. The best of these is probably Mr. Bruce Crane's "The Waning Year," but Mr. Thomas B. Craig makes a very good impression with his large picture of "Evening," and so does Mr. Hamilton Hamilton with his "The Last of September." Mr. F. Childe Hassan's "The Haystack," too, has attracted very favorable notice, and is a strong and satisfactory picture.

Among the pictures which, as they aim first of all to be beautiful, will have to be classed as "decorative," Mr. Blashfield's are easily first, and it is one of the few unpardonable things which the hanging-committee has done to sandwich his bright and beautiful "Under the Temple Eaves" between a dingy and uninteresting flower-piece and one of Mr. Eakin's hideous black portraits, where it is impossible to see it.

The exhibition is more complete than many of its predecessors have been, in that there are some very good water-colors, some admirable pastels, notably a portrait of a child by Miss Mary S. Cassatt, and a room full of very good black and whites, among them Vedder's drawings for the illustrations to the *Rubáiyát*.

A good deal is to be said in commendation of Captain Edward Kenney's sculptures of wild animals made during a residence of fifteen years among the Indians; of the portrait busts by Mr. George

Frank Stephens and by Miss Cohen, and of the exquisite three-quarter length portrait in bronze bas-relief of Dr. Weir Mitchell by Mr. St. Gaudens.

To finish the list of prizes, the Toppan first prize goes to Miss E. F. Bonsall, for her "Rejected," a picture of considerable merit, representing a young lady artist, bending tender but disconsolate over the half-opened box which contains her first exhibition picture, which a heartless committee has returned. The second prize has been awarded to Mr. W. B. Bridge's "The Sheep Pasture."

L. W. Miller.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

OLD NEWGATE, EAST GRANBY, CONN. SKETCHED BY MR. M. P. HAPGOOD, ARCHITECT, HARTFORD, CONN.

The hill upon which this reminder of the Revolution is situated is rich in copper, which was mined from 1707–1774, when the galleries were used as a prison for refractory Tories. The mines extend about three hundred and fifty feet east and west, and about eight hundred feet north and south, and being supplied with three air-shafts were considered good enough for the enemies of our liberty, and subsequently for other dangerous persons, being accepted by the Government as a State prison in 1790. The only structure above ground, beside the smelting furnace, was a wooden house for the guards, surrounded by a palisade; but several successful insurrections having demonstrated the inefficiency of such slight protection, the present buildings were started in 1801, and fulfilled their purpose until 1827, when the place, not meeting the modern requirements of a State prison, was abandoned for more commodious quarters in Wethersfield.

BOSTON & LOWELL RAILROAD STATION, WEST MEDFORD, MASS. MESSRS. RAND & TAYLOR, ARCHITECTS, BOSTON, MASS.

This little structure is built of pasture stone, and to give it a local interest the townspeople were asked to contribute any odd or interesting boulders they might have upon their lands: one, shown in the sketch, was enough like a bust to warrant setting it up on the outside as a piece of natural sculpture.

STORE OF W. & J. SLOANE: BROADWAY AND EIGHTEENTH STREETS, NEW YORK, N. Y. MR. W. WHEELER SMITH, ARCHITECT, NEW YORK, N. Y.

[Gelatine Plate, issued only with the Gelatine Edition.]

We regret very much that the constant traffic passing over Broadway at the time of day when the light is most propitious prevented our taking a view of the building on that, its most important side. The view now published barely serves to show why this building was mentioned by some who voted on the "best ten buildings" of the country.

THE METROPOLITAN OPERA-HOUSE, NEW YORK, N. Y. MESSRS. J. CLEAVELAND CADY & CO., ARCHITECTS, NEW YORK, N. Y.

[Gelatine Plate, issued only with the Gelatine Edition.]

The plans and a full description of this building were published in the *American Architect* for February 16 and 23, 1884.

SKETCHES FROM FRANCE, BY MR. W. C. RICHARDSON, ARCHITECT, BOSTON, MASS.

NOTRE DAME, PARIS, FRANCE, AFTER AN ETCHING BY LUCIEN GAUTIER.

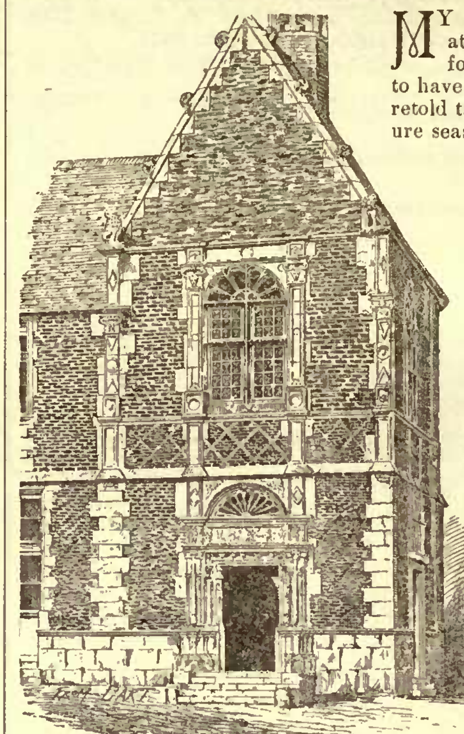
CHURCH OF OYESTREHAM.[1]

[1] From Cotman's "*Antiquities of Normandy.*"

The Interior Coloring of Ancient Libraries. — Not in Athens only, but in Rome and in Alexandria, there were Libraries containing tens of thousands of volumes, while in the provinces there were private book collections hardly less colossal. Pamphilus of Cæsarea, in Palestine, who was canonized after suffering martyrdom, A. D. 307, had a famous library, which he threw open to the public, and which consisted of 30,000 volumes. These noble institutions were frequented by students sufficiently numerous to require hygienic regulation. Thus, for example, the Roman parchment on which so many of the books were written had to be disused, as its extreme whiteness injured the eyes of the reader. According to Isidore of Spain (Bishop of Seville, A. D. 600–636), architects of libraries came to discountenance gilded ceilings, and to insist on the floors being of Carystian (that is, green) marble, because the glare of the gold was found to blunt the vision, while the green refreshed it (*quod auri fulgor hebetat et Carysti viriditas reficiat oculos*). For the same reason, in the coin departments of museums the students had to examine the denarii on cloths of myrtle green, and the artists in gems when at work used to glance from time to time at the backs of *scarabei*, than which nothing is greener (*quibus nihil est viridius*), says Isidore, to relieve the eye congestion induced by their minute and intense labor. — *Lancet.*

NOTES FROM ENGLAND.[1] — III.

MODERN PAINTERS. — I.

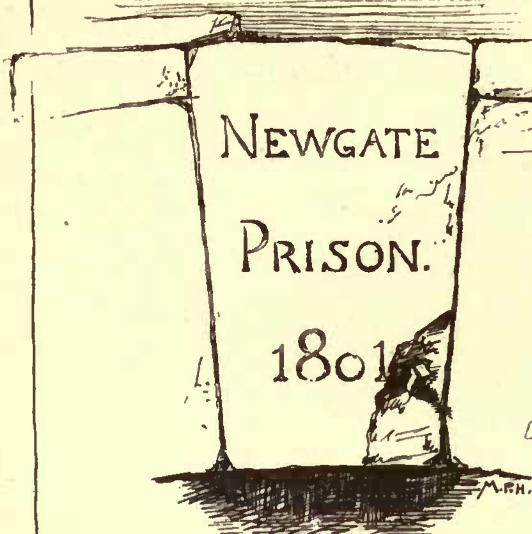

CHATEAU DE FLEURIGNY. FRANCE – THE CHAPEL.

My readers owe me a negative debt of gratitude, for I meant last spring to have told once more the oft-retold tale of the London picture season of 1885; and now that I look back through a perspective of several months, neither many of my impressions nor many of the pictures which excited them seem to have deserved reporting, and such retrospective criticism, by the way, so often comes *after* I have spoken, that I feel that I, too, have in this instance had an escape.

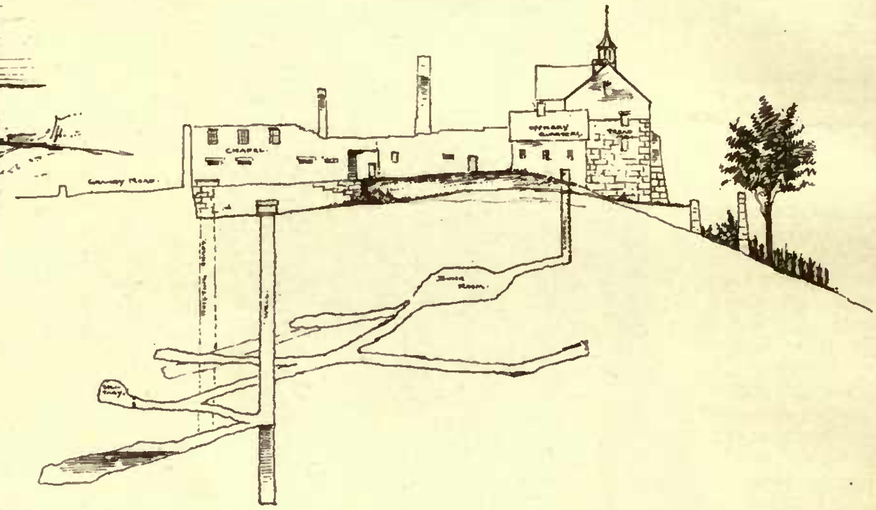
But the few impressions which I find still surviving in all their first clearness and intensity, seem, of course, to have gained double worth in contrast with the fading of the others. And perhaps I am now justified in speaking of at least the chief among them. This is the impression produced by the greatest of living English painters — by him who has lately conferred honor upon his country by accepting the first hereditary title she has ever bestowed on one of his craft. I mean, of course, Sir John Millais. Can it be necessary, though, that I should take pains to speak of one who is so well-known to praise? Certainly not, except for the sake of my own conscience, and perhaps for the sake of possible readers, who may still be as ignorant of his finest work as I long was, and consequently as inclined not to deny but to underrate his power.

As a rule, English painters are and always have been singularly unequal in their work, and Millais is not an exception. Many reasons might be found (or fancied) in his as in other cases. I will only note one which seems to me indisputable — the tendency of the English public at large, and even of its more critical circles to care more for *sentiment* in a work of art than for anything else. I do not mean pictorial sentiment — to care for that would work towards keeping the artist always at his highest level. I mean sentiment of subject-matter, what has been called "literary" sentiment; and that particular weak and nerveless phase which is, in truth, not sentiment, but sentimentality. Few, very few English artists have escaped its influence, either as latent in themselves or as forced upon them, so to say, by atmospheric pressure. Manly and vigorous by nature as is Mr. Millais (I think an American pen need not deny itself the more familiar name), he, too, has sometimes yielded to this national tendency. And it is curious and instructive, as proving the close connection between things spiritual and things material (that is, technical) in art, to note that his manly and vigorous brush is apt to show its qualities least clearly when its subject-matter least deserves these epithets. Of course I am only comparing him with himself when I speak of weakness; what one does not call strength in him might easily seem such in others. Naturally enough, his most "popular" pictures are those where the national taste finds greatest satisfaction. And their widest popularity, moreover, has grown through reproductions in which their faults (I mean their faults of sentimentality, or what seem such to me) are emphasized and their excellences are lost, —in which their color, for instance, is lost in black and white (too often of a very weak description) or horribly travestied in the gaudy tints of some "Christmas Supplement." Therefore it is that I think there may be many American readers who, while they fancy they know what is meant when Mr. Millais's art is named, and fancy they have reliable data by which to guage the wisdom of those by whom it is admired, are really very much astray. I know such had been my own case; and I had seen many canvases of his, as well as countless reproductions. All this is easy enough to say; I wish it were only as easy to explain what that art is in its highest potency — a something that cannot be told otherwise than from his actual works, and by the very best among them. These are not few, by any means. Indeed, it is remarkable that since great inequalities exist between his pictures, and since they have been very prolifically produced, their average should be so high, and the very best among them so numerous. Yet, though numerous, they are almost all in private possession and invisible to the majority of tourists — a state

[1] Continued from page 244, No. 517.



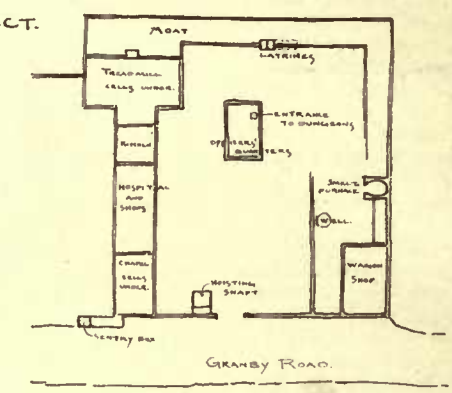
The Keystone.



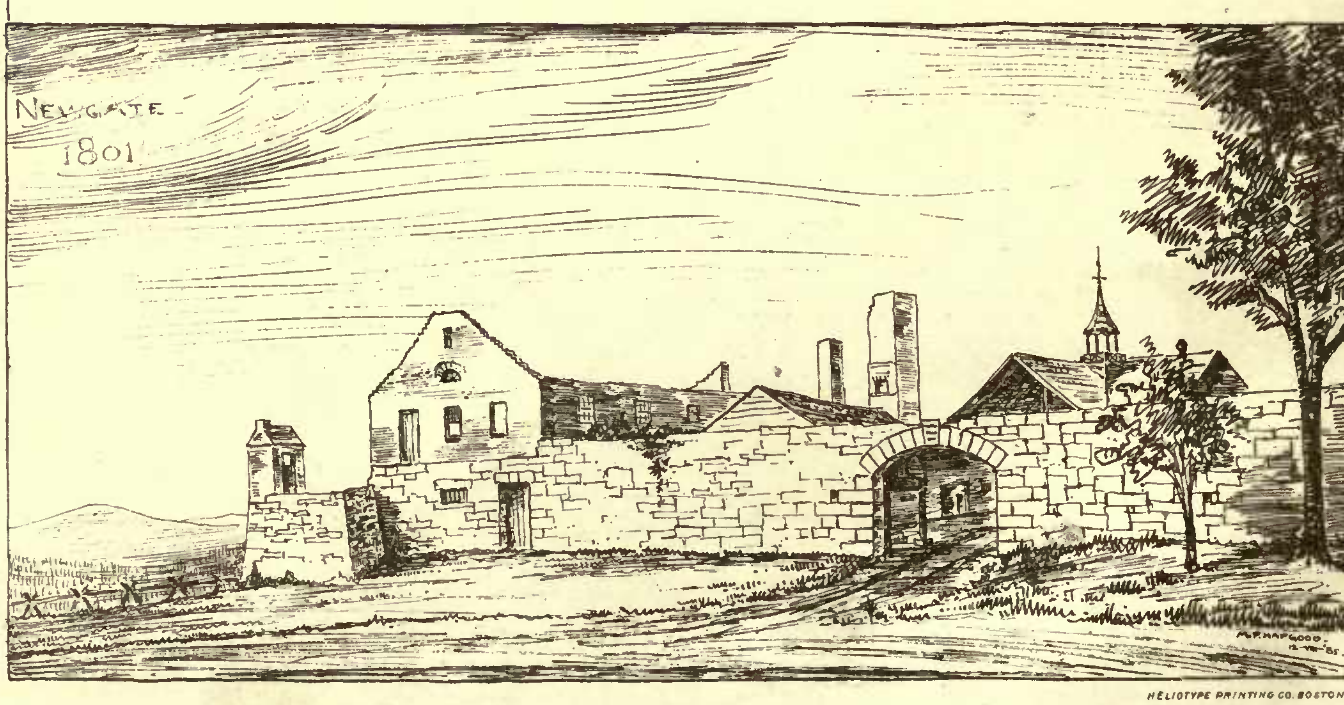
Sketched at East Granby, Conn.
by M.P. Hapgood,
Architect.
Hartford Conn.

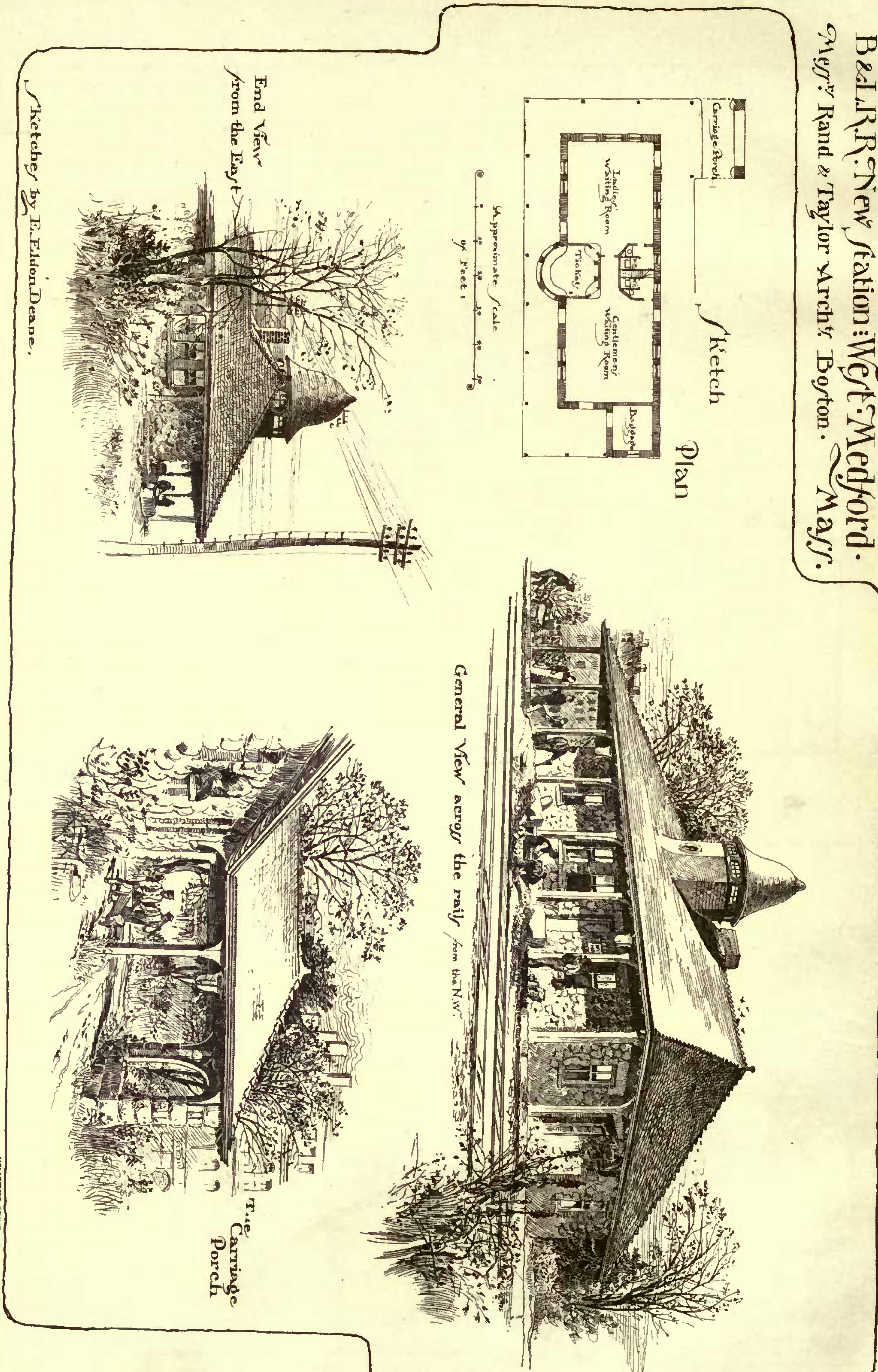


Northern Wall
and Smelting Furnace.



Plan of Newgate.



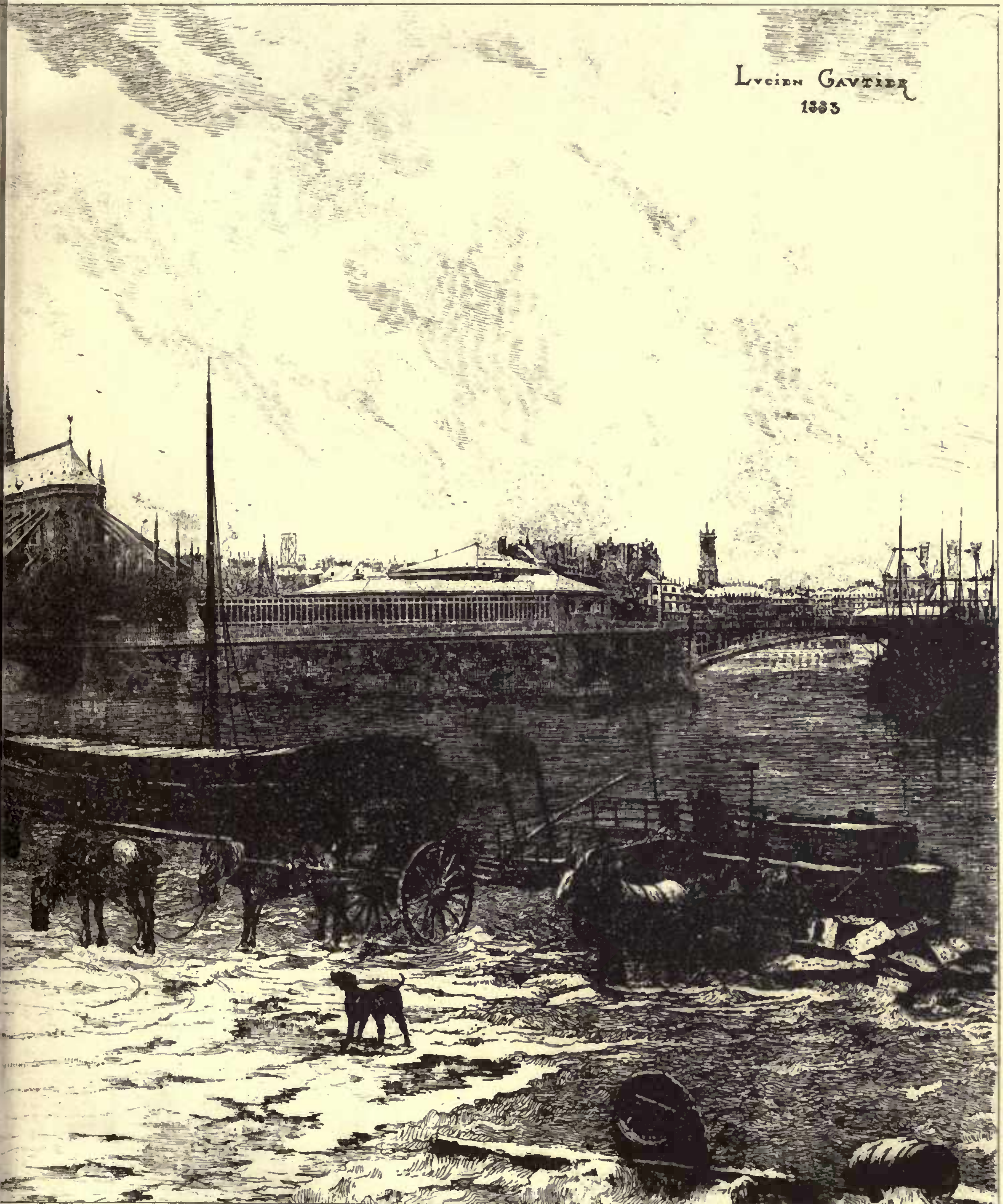


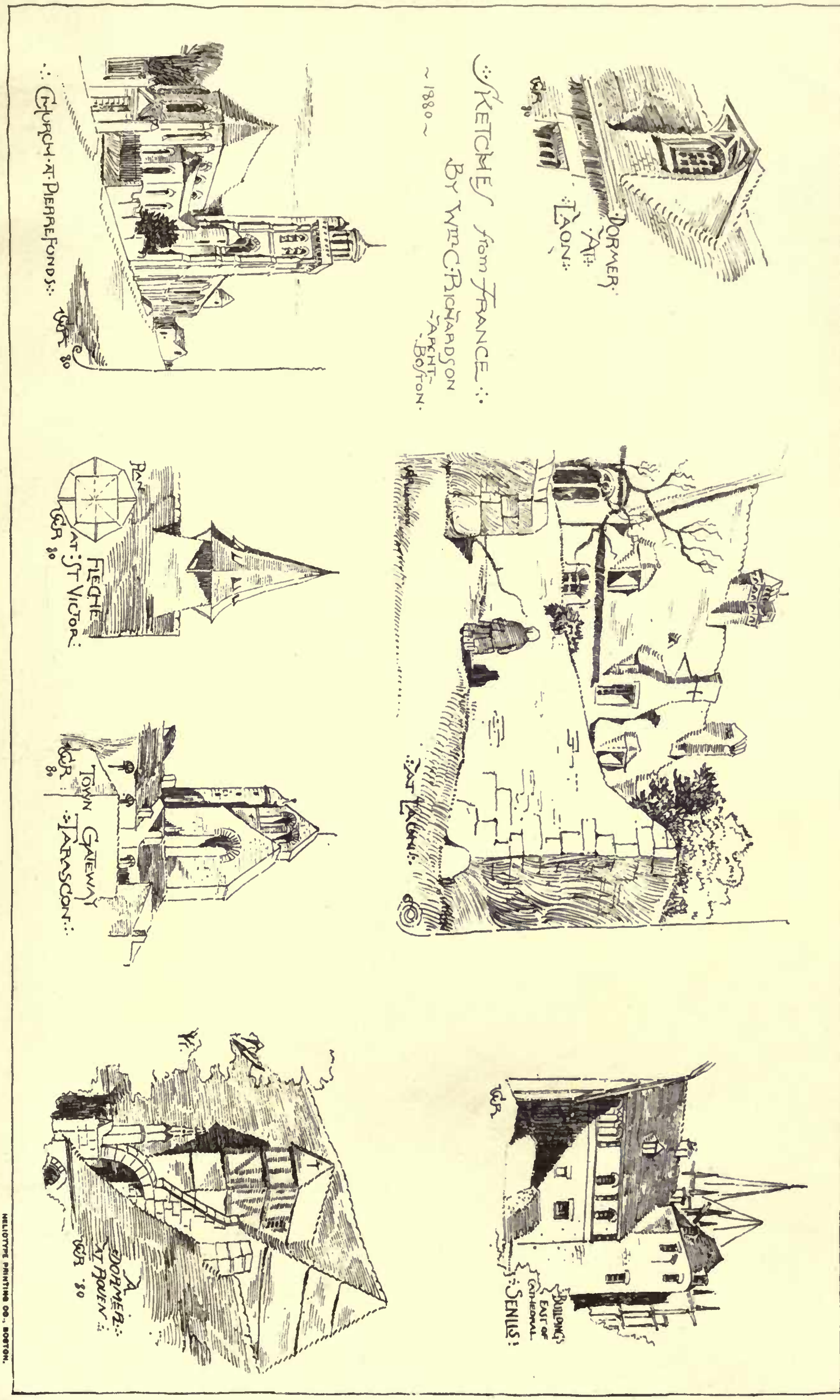
HELIOTYPE PRINTING CO., BOSTON.

American Architect and

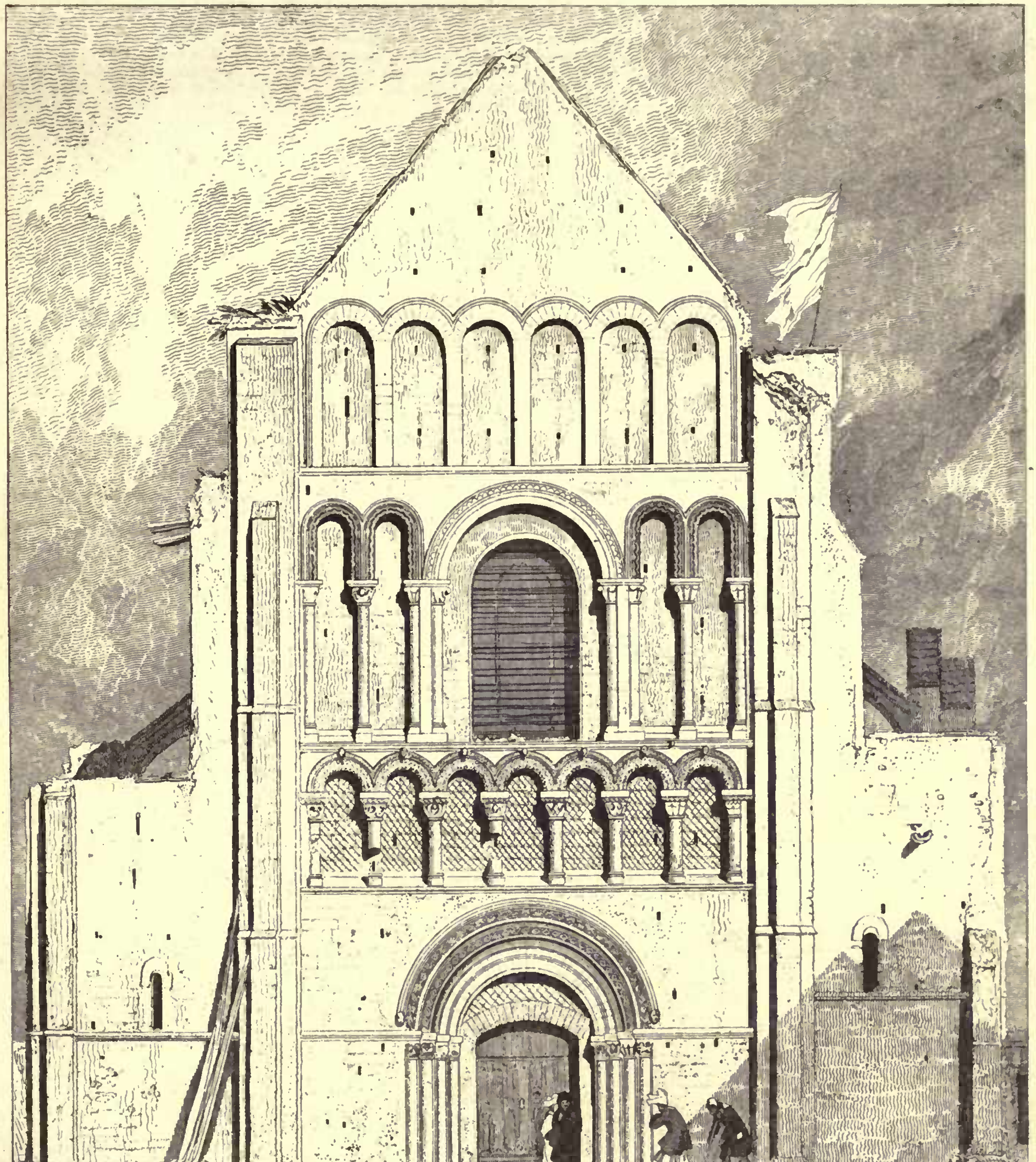


HELIOTYPE PRINTING CO., BOSTON.


LUCIEN GAUTIER
1883



HELIOTYPE PRINTING CO., BOSTON.



HELIOTYPE PRINTING CO. BOSTON

CHURCH OF OYESTREHAM.

West Front

of things which, one hopes and believes, will be remedied long ere our children's children seek the National Gallery of England.

We have been long accustomed to look to portraiture and landscape for the highest achievements of English art, and it is these two branches which should be considered to gain a full knowledge of Mr. Millais's talent. Of his landscapes, I regret to say, I cannot speak, for I do not know them well enough. Yet if I speak of his portraits only, I shall still speak of his best and highest and most characteristic work. As a portrait painter he will stand enrolled, I think, when his career is entered on the history of art, certainly as one of the two or three greatest portrait painters of his time, and as certainly, I think, as the very greatest of his time in England — as the one, and the only one who is akin, in the quality of his art, to the great twin English portrait painters of the eighteenth century. Broadly speaking, he is a worthy successor of Reynolds and Gainsborough; and narrowly speaking, it is Reynolds's tendency, not Gainsborough's, that he represents. For twins though they were in time, in station, and though they are in after fame, Gainsborough and Sir Joshua really stand for two contrasted tendencies in portrait art.

Excluding entirely from the list all mere depictors of superficial external facts (for however gifted such men may be as painters simply, they are not great portrait-painters), we find that the really great portrait-painters of every age fall into two distinct classes. One class, reading below the surface of the model, seem to paint him — the true, characteristic inner *him* — directly, straightforwardly, dispassionately; accenting, emphasizing, idealizing, perhaps, the soul they study; but not infusing it with traits drawn from their own souls. To this class belong, to take a few names at random, Holbein and Raphael and Velasquez, Titian and Veronese, van der Helst and most of his countrymen, and Sir Joshua Reynolds. The other class has Leonardo as its greatest example, and working with him, each in his own peculiar way, Rubens and Vandyck, Francia-Bigio and Moretto, François Clouet and Gainsborough. An artist like one of these, while also seeing the soul beneath the skin, while also accenting and intensifying it at times, cannot help infusing the translation with something personal to himself, cannot help mixing his colors in a light reflected from his own mood. If I may venture to be a little pedantic, and call the one class objective and the other subjective portrait-painters, I shall perhaps make my meaning clearer. An artist's leaning toward the one or toward the other may be but very slight, yet among the greatest artists it is only Rembrandt, I think, who is so perfectly balanced between the two tendencies that we hesitate to characterize his portraiture with decision. Rembrandt alone, it seems to me, has touched that highest level where we cannot pretend to say how much of what we read upon the canvas he had seen in Nature, how much was an infusion of his own soul; he alone, I mean, taking all his work together, for other painters have sometimes touched upon a similar level in isolated portraits.

Portrait-painters of the subjective sort are unquestionably those who charm and fascinate us most. Broadly judged as artists, they delight us most, for (however we struggle against the fact in these days of fervent "realism," of the cult of simple *actualité*) there is nothing so charming, so delightful in art as the revelation of the artist's own soul. Provided, of course, that the soul be intrinsically worth revealing, and be beautifully presented by the brush — certainly not otherwise. But I doubt, all the same, whether as portraiture, narrowly considered, their work is finest. There may be less charm in the art of the more objective painter, but there is apt to be more force, and there is certain, of course, to be more variety among its different results. If Raphael's popes, for instance, or Holbein's merchants do not appeal to us, do not touch and fascinate us as do Moretto's nobles and Francia-Bigio's striplings and Leonardo's women—they impress us more powerfully, and each of them with a distincter personal impression.

All of which has led me, in seeming, a good ways from Mr. Millais; but I wished to mark as clearly as I could the character of his art—to show what I meant when I said that not to Gainsborough but to Reynolds is he more akin. He belongs very distinctly, I think, to the objective class of portrait-painters. There is soul and not merely skin in every picture which shows him at his best; but it is the soul of the model, divined, translated, perhaps clarified or intensified, yet not altered out of its own semblance in the slightest, not colored by any reflection from the painter's soul.

The portrait of Mr. Gladstone which hangs at Grosvenor House (there have been two or three others painted more recently, but none quite as fine) is a masterpiece in the truest sense—that is, a masterly specimen of a masterly brush. It is more than a characterization, while most portraits are a good deal less than this: it is a conception, and of the most impressive kind. It is not merely the man painted for his friends, it is the statesmen painted for posterity. It is the ideal Gladstone as Englishmen of the twentieth century will love to picture him in imagination, will rejoice to find him pictured for them by a nineteenth-century brush. Even now with the echoes of Egypt ringing in one's ears, one forgets all possible faults and failures in presence of this picture — remembers only righteous struggles and splendid legislative triumphs. And more even than the ideal Gladstone it seemed to me — it seemed the ideal English statesman. I leave it to politicians to decide in how far the subject dictated this result—how much of the ideal statesmen was existent in the model, how much sympathetically imagined by the painter. All that concerns the critic is to note that in the man as he stood before him, the artist believed he saw certain intellectual and spiritual, as well as certain physical facts; and to delight in the grandeur of his conception, and the magnificent clearness with which it is expressed. In the man he saw it—not as a reflection from his own soul; and through an entirely "realistic," simply straightforward likeness he expressed it. It is the ideal Gladstone I repeat, but it is not an "idealized" Gladstone in the vulgar, trivial sense. The pose is of the simplest—a standing three-quarter-length figure with the face and glance turned a little over the right shoulder directly toward the spectator; but it is vital, energetic, spirited, as full of potential action as of repose, and extremely good in the composition of its lines—a point, by the way, in which very many even among clever portraits are extremely bad. It shows the man in his habit as he lives, loose black coat, high crumpled collar, negligent cravat and all. There is no positive beauty of color—for this we must look further on Mr. Millais's list; but there is great beauty as well as great harmony of tone. And the handling is bold, free, vigorous, yet finely modulated to a degree which would surprise those who only know Mr. Millais's brush, when it condescends on the one hand to something nearer emptiness, or on the other hand to something nearer that way of working which studio-slang calls "sweet."

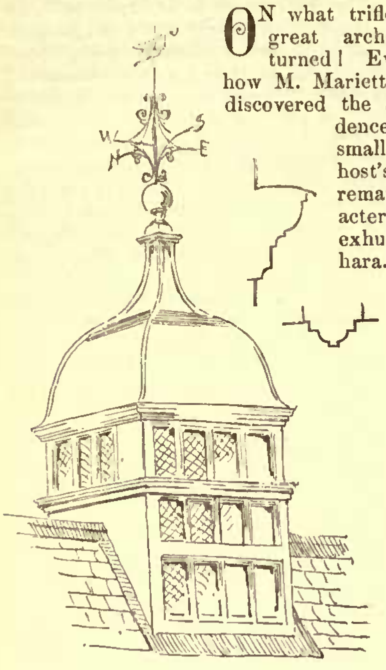
I have already said that a portrait-painter of the objective sort — one who finds character through sympathetic insight, and does not create or modify it through an infusion of his own personality—must of necessity produce results extremely various in sentiment. It is so to a marked degree with Mr. Millais. And still more noteworthy is the way in which, to suit the expression of different themes, he varies his executive methods—his composition, his tone, his color, and his handling. The mere witness of the eye would hardly have credited, for example, to the painter of the Gladstone a portrait of one of Lord Roseberry's little daughters which hung in this year's Academy. Against a beautifully rendered landscape background, with masses of foliage over her head, the little maiden in her quaint white frock and pink ribbons stood fronting us, smiling into our eyes with that shy, yet fearless innocence, that fresh, delicious baby grace we so often see in life, and so seldom, alas, on canvas. Again, as with the so different Gladstone, it seemed not an idealized, but yet an ideal figure, and the expression of more than a single personality. It seemed the ideal English baby, and we half forgot the painter's art, he had made his model to appeal to us. Yet how perfect was the art that could work such results. How naïf-seeming, yet profoundly artistic the composition; how charming the delicate harmony of pale tones, accented but not broken by the strong pink notes; how lovely the color throughout with this pink and the golden hair against the white of the dress, and the soft dull greens of the background. And how expressive the technique, which was far less sturdy and powerful than in the Gladstone, which was almost loose in fact, yet not with any approach to carelessness or lack of skill — which had just the lightness and grace and freshness needed to make the picture's sentiment what it should be. Here with a theme and a scale of color that might all-too-easily have led to them, there was certainly neither sentimentality of mood to be described nor "sweetness" of execution. This one picture, perhaps, in its color and its handling, though not in its feeling, recalled Gainsborough more than Reynolds; but it was no pastiche of either. It was a third and kindred yet original version of that tale of English babyhood which each of the great eighteenth-century masters had already told in an original way.

As a pendant there was shown close by a portrait which Sir Frederic Leighton had painted of Lord Roseberry's other daughter—perhaps not one of the President's very best works, but still a fairly characteristic example. The contrast was most instructive, as being between the two most popular English painters of the day, and as showing what diverse degrees of merit can sometimes command an almost equal degree of uncritical applause.

It was a pleasanter task to compare Mr. Millais's Lady Peggy Primrose (even the name chanced to accord with the idyllic charm of the canvas!) with another little maiden from his own brush whom I chanced to see at a picture-dealer's. Here again, although this time the theme was similar on the surface, the first thing one noted was the artist's wonderful versatility of conception and sentiment, and the wonderful way in which he can change his artistic speech to suit each varying artistic mood. The picture showed the three-quarter figure of a dark-haired, sturdy, rosy but deliciously high-bred and stately-looking little personage dressed in a quaintly-fashioned frock of yellow brocade and relieved against a dark-toned background. A little green parroquet perched on her outstretched hand, but she looked not at it but at the spectator with a steady, sober, gaze at once infantile and dignified. The expression of the face and the sentiment as a whole were as unaffected, as simple, as life-like, as enchanting as the expression and sentiment of the Lady Peggy Primrose, yet the two were wholly different from one another, so different as to be an extraordinary revelation of the artist's breadth of artistic imagination. And it was the same, as I have said, with the execution. Here the color was not tender, delicate and lovely, but strong, rich and brilliant; as entirely harmonious, but in a much more powerful way. And the handling was not light, rapid, facile, but firm, solid, compact. It was handling that taken by itself proved the artist an absolute master of his brush, but taken together with that of the Lady Peggy and that of the Gladstone proved him master not of one brush but of many — each unlike the other, and each a perfect instrument for the execution of the special task required of it. Seldom, indeed, can one say as much even of painters deservedly called great.

M. G. van Rensselaer.

HOW MR. PETRIE DISCOVERED NAUCRATIS.



Lantern: Staple Inn: Lond? from sketch by late A.H. Bridges Eng?

On what trifles, light as air, some of the great archæological discoveries have turned! Everybody knows the story of how M. Mariette, the French Egyptologist, discovered the Serapeum. During his residence in Alexandria he noticed a small white marble sphinx in his host's garden. He had previously remarked others of the same character in Cairo and Bedesdrayn, all exhumed from the sands of Sakhara. One day, while studying the sphinx in the garden, there suddenly flashed across his mind the line in Strabo which states that the Serapeum is reached by an avenue of sphinxes. He immediately began excavating in the Sakharan desert, and the Serapeum with the sphinxes that for centuries have guarded its entrance, was thrown open to the modern sun.

Austin Henry Layard, during his first visit to Constantinople, was looked upon by his fellows as a stupid young man, whose sole occupation consisted in lying on his back on the grass, his hands clasped behind his head, his hat tilted over his eyes, and a thin spiral of tobacco smoke curling up from under its brim. No one guessed that in the mind of the lazy youth the great dream of resurrecting Nineveh was slowly forming. And now another Englishman, Mr. Flinders Petrie, has made an equally remarkable discovery, and in a way almost as unexpected as M. Mariette. Mr. Petrie is an Egyptologist, and judging by his present discovery, a proficient in his profession. So nice and exquisitely accurate is his perception in Egyptian art that when last autumn at San a statue was shown him he immediately recognized beneath its conventional Egyptian form a strain of Greek art. Thereupon Mr. Petrie fell to thinking where this Greco-Egyptian combination could have originated. Where were the arts of Greece and Egypt so closely allied that they thus amalgamated in one form? To produce a statue of this description Grecian and Egyptian civilization must have gone hand in hand for centuries. Satisfied on this point, Mr. Petrie decided there was but one place in the whole of Egypt to which the statue could belong, and this was the ancient Greek city of Naucratis, formerly situated on the Canopic branch of the Nile, thirty miles from the sea. How or when Naucratis originated, no one knows. But in the sixth century, B. C., in the reign of the enlightened monarch Amasis, it became a great commercial city. Shortly before that period, Solon, visiting it to barter olive oil for corn, was struck by its prosperity. Amasis loved the Greeks. During his reign they were a privileged people. He gave to Naucratis a monopoly of the trade which afterward built up Alexandria. Herodotus tells us how "Amasis, being partial to the Greeks, gave them the city of Naucratis for such as arrived in Egypt to dwell in, and to such as did not wish to settle there, but only to trade by sea, he granted places where they might erect altars and temples to their gods."

Thus, under his fostering care, Naucratis became a noble and prosperous city, where Greeks from end to end of the Grecian confederacy concentrated to trade, to barter and to worship their gods. With their innate love of all that is best in art, they beautified their city. Herodotus describes with admiration their Hellenium— a wonderful place, half stock, exchange and half temple—in the building of which all the principal Greek trading cities had a share. Besides this, there were temples. The people of Ægina built one to Jupiter, the Samians built one to Juno, and the Milesians one to Apollo. Naucratis had natural advantages. "It was anciently," says Herodotus, "the only place of resort for merchants; there was no other in Egypt; and if a man arrived at any other mouth of the Nile, he was obliged to swear that 'he had come there against his will,' and, having taken such an oath, he must sail in the same ship to the Canopic mouth; but if he should be prevented by contrary winds from doing so, he was forced to unload his goods and carry them in barges round the delta until he reached Naucratis — so great were the privileges of Naucratis." With these numerous advantages the Greco-Egyptian city grew richer and larger year by year. When Herodotus saw it in the fifth century B. C., its coffers ran over with gold. In their houses and temples the graceful and cultured art of the Greeks tempered the cruder Egyptian architecture. In narrow, tortuous streets, where the hum of voices and the scrape of sandaled feet were heard all day, Greeks from Massilia, Greeks from Cyrene, Greeks from Athens and Sparta, Greeks from Corinth, Greeks from Tarentum, mingling with the swarthy Egyptians, jostled and bargained and shouted as men do on Pine Street to-day. In their temples young men and maidens offered up doves and vows to Aphrodite, and the city fathers besought the aid of Jupiter and Apollo, not in the love affairs and heroic combats, in which the gods were expert by long experience, but in their trading adventures. For centuries Naucratis continued to flourish. It was a great city when in the fourth century B.C., Alexandria was founded. That it still continued to exist in the Christian era, though probably much fallen from its high estate, is argued by the fact that Athenæus was born there in the early part of the third century A.D., though Ptolemy almost ignores it, which serves to prove it had then ceased to be of importance. After Athenæus all trace of it gradually disappeared. Its brilliant day set in gloom—possibly in some bloody fight between Christian and Pagan. Its extinction was complete. In time its name and site were forgotten, and in the course of centuries nothing remained but a few grassy mounds where once the arteries of the great Greco-Egyptian city had throbbed. It was wiped from the face of the earth and the memory of man.

Mr. Petrie having ascertained that the statuette was found beneath a mound in the delta, which an Arab tradition declared had once marked the site of an ancient city, felt sure it must be Naucratis. After visiting and finding that it corresponded in the details of its position with the few existing accounts of the lost city, he began excavations. The first objects he brought to light were Athenian coins and bits of archaic pottery with Greek inscriptions. This convinced him that he had discovered the lost city, and his further excavations confirmed the belief. Most of the city is now laid bare. The site is half a mile long. An immense building, some distance beyond the site, six hundred feet square, with walls of mud brick fifty feet thick and thirty feet high, Mr. Petrie identifies as the Hellennium. In its foundations have been found coins, agricultural implements, and bits of precious stone, gold and iron. Numerous temples have been exposed; some in woe-begone ruins, which suggest the ruthless hands of conquerors; some sufficiently preserved to reveal the Greek type of architecture; one, in especial, is undoubtedly Ionic in character, and bears on its columns sculptured wreaths of flowers for which Naucratis was famous. In what probably was the centre of the city a great block of buildings flanked by temples has been unearthed. Most of these temples date from the earliest periods of Greek art, and argue greater antiquity for Naucratis than archæologists have hitherto imagined. In one of them, of later age, innumerable fragments of bowls covered with inscriptions have been found. One bears an inscription dedicated to Apollo from Phanes, who began life in Naucratis. In everything so far discovered the styles of the Egyptians and Greeks are mixed, much to the confusion of Egyptologists less keen than Mr. Petrie.—*New York Evening Post.*

FIRES CAUSED BY STEAM-PIPES.



Cabinet. Panels: Music. Room: Garth. House: Perths? Scot? ex? by Rob? Christie.

It is an admitted fact that steam-pipes brought in close contact with wood have caused many fires. The Cincinnati *Price Current* says: —

"The fire chiefs, at their recent convention at Long Branch, '*Resolved*, That the practical experience of the members of this association warrants the declaration that steam-pipes and other heating-appliances have caused many fires, and that they constitute an evil in the building construction of the country which should receive the attention of State and municipal bodies.' When they did so they knew exactly what they were talking about. It has fallen under our personal observation more than once where steam-heating appliances occasioned fires, with evidence so strong as to leave not the slightest room for doubt, or reason to attribute the fire to any other cause."

The Baltimore *Underwriter* quotes the above and says: —

"If the *Price Current* has such evidence, so far as steam-pipes are concerned, let us have it. We have heard so much of this sort of talk, this mere assumption, this parrot-like repetition of the nonsense of some wiseacre who manufactures facts to fit theories, that for once we should like to be refreshed with the testimony by those who lay down the law. We have never heard of one properly-authenticated case of fire from steam-pipes, notwithstanding 'the practical experience' of the fire chiefs and the cool assertion of the *Price Current.* According to our observation there is not only 'room for doubt,' but room for nothing but doubt."

We are surprised that Dr. Bombaugh, who is not only a learned physician and an expert in insurance matters, but whose journal was once the official paper of the National Association of Fire Engineers, should be so skeptical on this point. At the convention of engineers at Long Branch, Chief Shay of New York, ex-Chief Damrell of Boston, ex-Chief Sexton of St. Louis, and several other prominent expert firemen, testified from their own knowledge that steam-pipes had set fire to buildings. If further testimony is necessary to convince our esteemed friend, the doctor, that he is in error, if he will drop in at the rooms of the New York Board of Underwriters, the gentleman in attendance will be happy to show him ocular proof that steam-pipes have and will set fire to woodwork, in the shape of charred beams that were set on fire by them. Chief Damrell gave a report of some experiments he personally conducted to test the matter, stating that after exposing some heavy timber to the heat of steam-pipes in an enclosed space, on letting in the air, the wood burst into flames.

The Cincinnati *Price Current* has replied to the Baltimore *Underwriter's* criticism as follows: —

"The Baltimore *Underwriter* calls upon the *Price Current* for its evidence that steam-pipes will set wood on fire. Stix, Krouse & Co.'s wholesale clothing-house on Race Street, in this city, has a steam radiator near the front of the building. Around it and near it is a false or raised floor, occupied by desks and surrounded by railings. At an early hour on the morning of December 17, 1881, the watchman in the street saw a light in the house, which has a glass front, and discovering that it was an incipient fire, broke open the doors and extinguished it. We were on the ground in about three hours afterward, and before anything had been disturbed or changed. We examined the whole matter carefully, and no other conclusion could be reached than that the steam radiator had set the false floor on fire. The same opinion was held by every one who saw it. Chief Wisby of this city tells us of a fire that occurred last winter in the building at the corner of Court Street and Central Avenue. The details would occupy more space than we have at our disposal. Chief Wisby and others present at that fire have no hesitancy in saying that the fire was occasioned by steam-pipes that lay upon the wood. If the *Underwriter* will call upon Inspector Holloway of its own city, we feel certain that he can furnish evidence in support of the opinions expressed by the fire-chiefs of the country, at their late convention at Long Branch, 'that steam-pipes and other heating appliances have caused many fires.' Gentlemen who have 'room for nothing but doubt' upon this question, we think, will have to change their theories to fit the facts."

The following paragraph in the St. Louis *Republican* of October 26, is respectfully referred to the Baltimore *Underwriter:* —

"A promising blaze was discovered in the assessor's office, in the south wing of the court-house, at 4.55 o'clock Saturday morning by a *Republican* reporter, and the fire-alarm office in the same building notified. An alarm was sent to the fire-department and the laddies promptly responded. The men of Truck Company, No. 3, extinguished the blaze with the extinguishers before it had gained any headway. The fire was caused by a hot steam-pipe coming in contact with the frame near the window."

It might be of interest to those interested in this question to know that Dr. Bombaugh's skepticism as to fires caused by steam-pipes is probably influenced by the fact that the building in which the office of the Baltimore *Underwriter* is located is owned by a fire-insurance company; that the steam-pipes by which the building is heated pass in almost immediate contact with various wooden partitions, and that the company is aware of the fact and pooh-poohs the danger of fire resulting.—*The Spectator.*

FREEZING-MIXTURES.



An. Interior: Bedford Park: London Eng. E J May, Architect.

IT often happens that a plumber desires to stop the flow of water in a pipe when there is no way to turn it off. He must then resort to the use of some freezing-mixture. The one most often used is ice and salt. The cold is produced by the large amount of heat abstracted from the body surrounded, necessary to change the ice and salt to a liquid state. It is probable that few people know the proper proportions of these two substances to put together to secure the best result. To inform those who have occasion to use such mixtures the *Sanitary News* has compiled a list of the freezing-mixtures readily prepared. The first column gives the ingredients with their proper proportions, the second gives the temperature to which the thermometer sinks in the different mixtures, and the third gives the actual reduction of temperature which takes place in degrees Fahrenheit. The degrees below zero are prefixed by a minus sign: —

Mixtures.	Thermometer sinks, degrees, F.	Actual reduction of Temperature, degrees F.
(1) 2 parts snow or pounded ice, 1 part sodium chloride (common salt)	to — 5	
(2) 5 parts snow or pounded ice, 2 parts sodium chloride, 1 part ammonium chloride	to —12	
(3) 24 parts snow or pounded ice, 10 parts sodium chloride, 5 parts potassium nitrate	to —18	
(4) 12 parts snow or pounded ice, 5 parts sodium chloride, 5 parts ammonium nitrate	to —25	
(5) 1 part ammonium nitrate, 1 part water	from 40 to 4	36
(6) 4 parts ammonium chloride, 5 parts potassium nitrate, 16 parts water	" 50 to 10	40
(7) 5 parts ammonium chloride, 5 parts potassium nitrate, 8 parts sodium sulphate, 16 parts water	" 50 to 4	46
(8) 5 parts sodium sulphate, 4 parts dilute sulphuric acid	" 50 to 3	47
(9) 3 parts sodium nitrate, 2 parts dilute nitric acid	" 50 to — 3	53
(10) 3 parts snow, 2 parts dilute sulphuric acid	" 32 to —23	55
(11) 1 part ammonium nitrate, 1 part sodium carbonate, 1 part water	" 50 to — 7	57
(12) 8 parts snow, 5 parts hydrochloric acid	" 32 to —27	59
(13) 6 parts sodium sulphate, 4 parts ammonium chloride, 2 parts potassium nitrate, 4 parts dilute nitric acid	" 50 to —10	60
(14) 9 parts sodium phosphate, 4 parts dilute nitric acid	" 50 to —12	62
(15) 7 parts snow, 4 parts dilute nitric acid	" 32 to —30	62
(16) 4 parts snow, 5 parts calcium chloride	" 32 to —40	72
(17) 2 parts snow, 3 parts crystallized calcium chloride	" 32 to —50	82
(18) 3 parts snow, 4 parts potash	" 32 to —51	83
(19) 6 quarts sodium sulphate, 5 parts ammonium nitrate, 4 parts dilute nitric acid.	" 50 to —40	90

THE STONE-SAWING MACHINE.

ROCHESTER, N. Y., November 9, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,— In your issue of November 7 you refer to an invention for sawing stone, by Mr. M. Gay. Could you give me the address of Mr. Gay, or in any way give a more detailed explanation? For instance: Size of wire used, practicable length of cut made; is this mode of sawing stone patented in this country? Please answer, and oblige, Yours respectfully, P. PITKIN.

[We have made further inquiries, and hope to answer these questions later.—EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

ACCIDENT TO A CAISSON.—A huge caisson sunk fourteen feet into the mud and water of Schuylkill River, below Gray's Ferry, where a bridge is being constructed, suddenly rose and careened from an excessive air-pressure, so that the pipes connected with the air-pump were broken. Nine men working in the interior escaped in the air-lock, and, aside from delaying the work, no serious damage was sustained. — *Iron Age.*

ST. PAUL TO HAVE AN ICE PALACE.— It has been finally decided that St. Paul will have an ice palace this winter. Fifty men have subscribed $200 each toward its construction. The movement is not a money-making scheme, for after the subscribers have been repaid, the balance, if any, is to be divided among the charitable organizations of the city. The palace is to be one hundred and fifty feet by one hundred and twenty-five feet, with numerous towers of the Norman style of architecture. The main building will be surrounded by a fence made of shrubs covered with ice, a beautiful effect being secured by spraying the shrubs and allowing the spray to freeze. Between this ice-fence and the walls of the palace will be constructed a race-course. The interior of the palace will be lighted by electricity. Electric lights will also illuminate the race-course and the entrance to the palace. The interior arrangements will be similar to those of the Montreal palace.—*Boston Transcript.*

AN OLD NORWEGIAN WOODEN BOOK.— From Scandinavian regions we sometimes hear of wooden antiquities being disinterred, which ages have swept over obliviously, but which, when brought to light, are of great interest, as connecting links between the present and the past. Sometimes it is a ship, but the latest discovery, though infinitely smaller, is even more curious and admirable. The description is from *St. James's Gazette:* "The process of restoring a characteristic old wooden church at Hopperstad, in the Hardes district of Sogne, in Norway, has brought to light an interesting Norwegian mediæval relic. In a closed niche a book, consisting of six wax tablets, was found, carefully enclosed in a casket of wood and leather. The tablets are of boxwood, covered with wax, each tablet having a thin border, so as to hinder the tablets from sticking together on closing the book. This precaution has helped to keep it in excellent preservation. The contents are chiefly drawings, made by a fine style, representing scenes from village and rural life. At the end there is a large catalogue in Latin of various kinds of animals, with a translation into old Norwegian; and from this it has been conjectured that the greater portion of the book dates from the close of the thirteenth century. But there are indications that part of the book is of earlier date. The tablets are fastened together at the back, and the cover is carved and inlaid with various small pieces of differently-colored woods. The book has been placed in the Museum of Antiquities in the University of Christiania, and it is intended to publish it shortly in fac-simile."

The Ancestor of the Coney Island Elephant.—It seems that the Coney Island Elephant, though the largest of his kind, is not the first. The great Napoleon had erected a colossal elephant, some forty feet high, in Paris, which was still standing in 1832. It is described in Hugo's "*Les Misearbles*," and stood near the present site of the Bastile column.

Discovery of Forgotten Statues in London.—Three statues have just been brought to light from the cellars underneath the old Courts of Law at Guildhall, London, where they have been hidden for many years. They formerly stood in front of Guildhall Chapel, and are life-size representations of King Edward VI., King Charles I., and his consort Queen Henrietta Maria. All three possess great artistic merit, the figure of Charles I. in armor being particularly effective. The statues are only slightly injured, and compare very favorably as works of arts with those (four in number) removed from Temple Bar, which now stand close beside them in the vacant ground behind the Guildhall. They are probably of the date of the fire of London, and deserve, as they no doubt will receive, safe custody in the Corporation Museum at Guildhall.—*N. Y. Evening Post.*

Oldest Habitations in America.—Major Powell, Chief of the Geological Survey, who has been about a month in the field, has discovered in New-Mexico, near California Mountain, what he pronounces to be the oldest human habitation upon the American continent. The mountains in this vicinity are covered with huge beds of lava, in which the prehistoric man and his comrades excavated square rooms, which were lined with a species of plaster made from the lava, and in these rooms were found various evidence of quite an advanced civilization, among them a species of cloth made of woven hair, and a large number of pieces of pottery. In the sides of the rooms cupboards and shelves were excavated. In one room sticking out of the bare face of the wall, was a small branch of a tree. When this was pulled out it was found that there was a hollow space behind the wall. Colonel J. H. Stephenson, Major Powell's assistant, broke this with a pick and found a little concealed niche, in which was a small carved figure resembling a man done up in a closely woven fabric, which with the touch of the hand turned to dust. It was blackened and crisp, like the mummy clothes of Egypt. In all, some sixty groups of these lava villages were found, there being twenty houses in each group. The evidences of civilization were similar, but removed by their crudity and evident want of skill a good deal from the articles found in the cliff-houses which have been so fully written up in the reports of the Geological Surveys.—*Santa Fé New-Mexican.*

The Abolishment of Blizzards.—We think the following from the New York *Commercial Advertiser* an unusually good sample of the American humor that is so puzzling to foreigners:—The proposal, recently commented upon in these columns, to build a dam across the Straits of Belle Isle and thereby make a good orange and cocoanut country of New England, suggests the doing of something to improve the climate of Dakota and other parts of the west, where cyclones and blizzards make their lairs. It is known that blizzards and cyclones are only winds in an exaggerated and intemperate form. It is also known to every scientific mind that force expended is force done for, so to speak; that is to say, that force expended in one way cannot expend itself in another, on much the same principle that a quarter given to the waiter to-day can have no effect in purchasing his complaisance on another day. With these great scientific facts in mind, we venture to suggest to the Dakotans the propriety of setting up an elaborate system of windmills on their borders as a remedy for the intemperance of their climate. A windmill, especially if it be a patent, improved one, cannot be turned without the expenditure of a great deal of force, and, if the wind turns it, the wind must lose in the process some part of its capacity to do harm as a blizzard or a cyclone. Obviously if there were enough windmills for the winds of the northwest to spend their fury upon, there would be no more blizzards or cyclones to make folks uncomfortable. As nearly as we can estimate, it would not cost more than about $900,000,000 to provide a proper supply of good, inert, patent, windmills for this purpose, and M. de Lesseps would cheerfully undertake to raise that sum, doubtless, by stock subscription. The feasibility of the scheme is apparent.

Stone Ruins in the South-West.—At the recent meeting in Albany of the National Academy of Sciences, Major J. W. Powell read a paper "on the stone ruins of the Colorado and the Rio Grande," giving the results of his travels and explorations this summer in the south-western portion of the United States, where there is an area of arid land larger than all the eastern and middle States, destitute of forests. The sites of six or seven hundred ruins of stone villages have been found. They vary greatly in character. The older ruins are at the north. Near the Mexican border are twenty-nine villages now inhabited. The newer buildings contain many more rooms than the old ones, increasing from two to five up to a hundred. The several classes of stone dwellings are those on the plains, those on the cliffs, which are not cave dwellings, the cave dwellings proper and the underground dwellings. He examined lately the dwellings of Indians among the San Francisco mountains and others in the Cataract Cañon, and of the Santa Clara Indians, thirty miles from Santa Fé, on the Rio Grande del Norte. From tribes speaking four different languages and having four different origins, he had the same history, namely, that the cliff-dwellings were constructed after they learned to build houses, and were adapted to the exigencies of war. The building art has developed in this line: first, dwellings on the plains; second, cliff-dwellings; third, caves; fourth, pueblos. He now regards the number of buildings as no criterion of the population, since he finds to-day causes operating to induce the construction of an excess of buildings. Indians are superstitious, and, like savages the world over, regard death, not as the natural finish of life, but as the work of an enemy, either visible or invisible. Hence, on the death of a chief, or the outbreak of a pestilence, they believe the soil to be haunted and seek new abodes, abandoning the old ones. The changes in water-courses, and the drying up or filling up of river channels, or the loss of a river by sinking into the ground, causes the abandonment of many pueblos, and this accounts for the existence of pueblos where no water is now found, which used to be called dry pueblos. Major Powell insists that these must all have had water originally.—*N. Y. Commercial Advertiser.*

The Richest Architect in this Country.—Until it is disproved, the Chicago *Times* can be quoted as authority for the belief that the richest American architect dwells in the city by the lake. He is evidently, on this authority, the "prominent architect" who is quoted as having said, last week: "I will give any man $100,000 who will produce anything that will prevent a wall of pressed brick from turning white."

Discovery of a Roman Race-course at Nantes.—Archæological research has recently revealed in the neighborhood of Nantes the existence of a race-course of presumably Roman origin. The foundations of the hippodrome occupy an area of about two hundred and twenty-three by one hundred and seventy-four metres. Further discovery has been made in the vicinity of an ancient roadway leading to the Loire, near the banks of which river traces of a number of villas prove the existence of a buried city, inasmuch as a theatre capable of accommodating four thousand persons has been brought to the light of day. A quantity of ornaments, jewels, and pottery has been recovered among the ruins. Thus far the absence of coins has frustrated the endeavors of savants engaged in unearthing the relics to establish the epoch of this most-recently-found city of the Roman occupation.—*New York Evening Post.*

Henry Emlyn's Windsor Order.—There was an attempt of singular kind made some years since by an architect at Windsor, who published a magnificent treatise, and executed one portico and a few door-cases in and near Windsor. This was H. Emlyn, who conducted the restoration of St. George's Chapel. This Order, he says, was first brought into his mind by the twin trees in Windsor Forest. He makes an oval shaft rise about one-fourth of its height, and then two round shafts spring from it close to each other, and the diminution affords space for two capitals, which have volutes, and, instead of leaves, feathers like the caps of the Knights of the Garter. His entablature has triglyphs, and his cornice mutules. The triglyphs are ostrich feathers, the guttæ acorns, and the metopes are filled with the Star of the Garter. To conceal the awkward junction of the two columns to the lower part an ornament is placed there, which is a trophy with the Star of the Garter in the centre. It is obvious that this Order must be extremely unmanageable, as it is difficult and indeed almost impossible to make a good angle column, and if its entablature is proportioned to the diameter of one column it will be too small; if to the whole diameter it will be too heavy, and a mean will give the capitals wrong, so that in any shape some error arises. In the portico above mentioned, the entablature is so light as to appear preposterous. This attempt is not generally known, as the book was very expensive, and the portico at a distance from a public road; but it deserves consideration, because, though the idea was new, its execution seems completely to have failed, and, indeed, in large designs, no composed Order has ever yet appeared that can come into competition with a scrupulous attention to these excellent models of Greece and Rome, now through the effects of graphic art happily so familiar to almost every English architect.—*Thomas Rickman.*

Draining the Pinsk Marshes.—Few people are probably aware of the great engineering undertaking, in which Russia has been engaged for years, of draining the Pinsk marshes. These are so extensive as to secure special designation on the ordinary map of Europe, being, we believe, the only case of the kind; and, in point of area, are very much larger than Ireland. Situated on the Russo-Polish confines, they have become famous in Russian history as a refuge for all manners of romantic characters, and have remained an irreclaimable wilderness in the midst of a prosperous corn-growing region up to within the last few years. In 1870 the Russian Government first took in hand seriously the abolition of this wild expanse, which, owing to being perpetually more or less submerged and covered with a jungle growth of forest, prevented not only communication between the Russian districts on either side, but also between Russia and Austro-Germany. Consequently a large staff of engineering officers and several thousand troops were drafted into the region, and these have been engaged upon the undertaking since. Up to the present moment about four million acres have been reclaimed, thanks to the construction of several thousand miles of ditches and of canals so broad as to be navigable for barges of several hundred tons burden. Just now the engineers are drawing up the programme for next year, which comprises the drainage of 350,000 acres by means of the construction of one hundred and twenty miles of ditches and canals. Of the four million acres already reclaimed 600,000 acres consisted of sheer bog, which has been converted into good meadow land, 900,000 acres of "forest tangle," which have been prepared for timber purposes by cutting down all the underwood and thinning the trees, 500,000 acres of good forest land—forest oases in the midst of the marshes—hitherto inaccessible, but which have been connected more or less by navigable canals and thereby with the distant markets, and finally 2,000,000 acres have been thrown open to cultivation, although only 120,000 acres have been actually occupied up to now. Besides making the canals and ditches the engineers have built one hundred and seventy-nine bridges, bored one hundred and fifty-two wells from forty feet to eighty feet deep, and four hundred and twenty-five from twenty feet to forty feet, and have made a survey of 20,000 square miles of country hitherto unmapped. When their task is finished Russia will have effaced from the map of Europe one of the oldest and toughest bits of savage nature on the continent, and a few years will suffice to render the Pinsk marshes undistinguishable from the rest of the cultivated region of the sources of the Dnieper. From an engineering, geological, and scientific point of view, generally, the work is one of special interest, and capable globe-trotters, anxious for a novel theme, might do worse than spend a few months amidst the fading Pinsk marshes, describing the changes in progress.—*Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

TRADE SURVEYS.

Real-estate buyers and sellers will endorse the statement that there is even now as there has been all along a more than ordinary degree of activity in property eligible for house-building and manufacturing purposes. The fairly well-kept record of real-estate transfers in the various cities shows this. The more significant and important transactions are those covering sales of land recently occupied as farm-land, or land attached to country residences. These extensive purchases of recent occurrence may have been due simply to the foresight of shrewd men, who know that in a few years these lands will greatly appreciate in value. Statistics indicate a much more rapid growth of city than country population. The attractions of city life, the improvement in the general health of cities, and the manifold advantages of urban over rural residence, all point to the probability of a great continuous appreciation of the value of land near cities which may be necessary for building purposes within a few years. The best real-estate authorities in New York, Philadelphia, Chicago, St. Louis and other cities besides our own city, agree in the general conclusion that land near cities will advance, and that something akin to a speculative movement on a moderate scale, and within legitimate limits will very probably develop itself. For farming and gardening purposes these lands are declining in value. Farm and garden products are supplied by rapid and cheap transportation rates from more favored localities. Besides, urban life is soon to be favored by more rapid travel of some kind or another. The nature of the growing demands in this direction points to a very great improvement over existing methods. Even the imagined absolutely perfect system of elevated roads in New York are found unequal to visible requirements. Electric motors have been tried there, and in Philadelphia, while schemes are under consideration in Chicago, Cincinnati and one or two other Western cities for the provision of better and more abundant inter-urban travelling facilities. There are other considerations than these, which point to the outflow of population to easy distances from the centres of business, social and commercial life. Hence it is not at all surprising to read of and hear of large real-estate transactions in land near cities. The movement is not confined to cities. Towns, some small, are feeling the stimulus of improving prices. The improvement will be discounted by purchases in the most desirable locations. This is by no means a new movement or incident. The tendency to suburban residence is simply receiving a further impetus, a greater number of people are desiring to take advantage of opportunities offered.

The architects, so far as reports of the past few days are to be taken as evidence of the general condition of business, are receiving instructions for future work, much of which is for manufacturing plants, and large buildings for manufacturing purposes. Manufacturing enterprise has received an additional stimulus this year, which must be felt in the building trades next season. Manufacturers are even now preparing goods for their spring trades in most manufacturing centres, a not unusual custom at all, but in view of the extreme caution that has characterized their movements for months their present activity so far in advance of actual requirements is deserving of notice. Rail mills have sold two-thirds of the products of 1886, but the allowance will be increased. Prices have advanced to $35 per ton, equal to thirty-three per cent over summer quotations. Nailmakers east of the Alleghenies are sold up at $2.50–$2.75, and in the West the strike continues without change. No other branch of the iron trade seems able to profit by combination. The busy and oversold pipe-makers say that they are merely getting back a new dollar for an old one. Merchant-iron makers in about a dozen Pennsylvania and Ohio mills have already returned to day-work alone; but this is in part due to the invasion of steel, which is steadily supplanting iron. In Western Pennsylvania a company is being formed to manufacture armor plate for the Government, and under sufficient guarantees all the heavy material and ordinance required will be furnished at home, though at an advance of twenty or perhaps twenty-five per cent over the prices that would be named abroad.

The growth of city and town population, our observant architects say, is leading to finer buildings and much finer architectural work. A local pride is leading to a friendly rivalry in the size and beauty of public buildings, theatres, churches, school-houses, banks and other buildings. A larger than usual number will be built next year. Economical considerations has held the desire for fine municipal buildings in check. This spirit of improvement is principally to be seen in the Western States, where there is a desire to do everything on a large scale and in elegance. The Chicago architects speak of this kind of work particularly. In New England towns and cities a number of manufacturing corporations will erect houses for their employés. The attention of employers of labor is being directed to this matter, and examples of the successful application of such business philanthropy are furnished. What has been done in seventeen hundred dwelling-houses at Pullman, Ill., it is argued, can be done elsewhere. Besides, there are other points to look at. Labor, without homes and its obligations, without constant and assured employment, is troublesome and dangerous. Well-housed and well-fed labor does not often strike. There are, of course, exceptions, but most labor troubles may be said to be due to the goading inspiration of poverty. The coming year will witness greater results accomplished for the better housing of the masses than has been accomplished in a like period ever before.

The general condition will be improved by fair railroad building. Numerous engineering schemes are also likely to be undertaken. The multiplication of small shops will continue. New companies and firms are forming much faster than the rate at which failures are occurring, viz., one thousand, nearly, per month.

The lumber trade is quiescent in all markets. In the North-west it is thought by good authorities that the wise and conservative course of the past year or two will be lost sight of under the anxiety of so many lumbermen to make up for past dullness. New sources of lumber-supply are within easy reach, and but little inducement will serve to overload the markets of the country. White pine is very low in all Atlantic tide-water markets. The usual fall advance in freight has not helped prices. Yellow pine is cheap and abundant. Hemlock is demoralized. The hardwoods are firm in all markets, and a slight improvement is probable.

Building material — brick, cement, plaster, laths, shingles, iron, lumber, paints — are all steady in price in all markets. Manufacturers have done all in their power in the way of competition, and a truce is declared on all sides against further hostilities.

The lull in activity incident to the season will not be prolonged. The lesson taught buyers this autumn has impressed on them the necessity of not postponing contemplated business too long. But little variation in values is possible under existing industrial conditions.

BUILDING PATENTS

[Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

330,186–189. KNOB-ATTACHMENT. — Williston I. Alvord, Bridgeport, Conn.

330,196. ASPHALTIC MASTIC. — Amzi L. Barber, Washington, D. C.

330,197. ASPHALTIC CEMENT FOR PAVING, ROOFING, ETC.—Amzi L. Barber, Washington, D. C.

330,203. WINDOW-BLIND. — Samuel R. Bicknell, Dedham, Mass.

330,204. BASIN OR TUB. — Charles A. Blessing, Philadelphia, Pa.

330,210. ENGINEER'S REVERSIBLE LEVEL.— Chas. F. and Thomas Cooke, York, England.

330,218. PORTABLE FURNACE FOR TINNERS. — Peter J. Fitzgerald, Philadelphia, Pa.

330,236. LOCK FOR SLIDING DOORS.—Miles Hayden and William C. Dixon, Gay Hill, Tex.

330,248. SLATE-DRESSING MACHINE. — Francis R. Marks, Ashland, O.

330,253. PIPE-CUTTER. — William E. Mellborn, Erie, Pa.

330,286. DOOR-HANGER. — Albert J. Bates, Joliet, Ill.

330,321. PLASTERING DEVICE. — Harvey B. Hall, Homer, Ill., and Francis G. Powers, South Bend, Ind.

330,339. ROLLER FOR SLIDING DOORS. — Noah Lucas, Norwich, Conn.

330,352. AUTOMATIC FLUSH-TANK.—Andrew Rosewater, Omaha, Neb.

330,356. APPARATUS FOR DISTRIBUTING AND DIFFUSING LIGHT. — Alexander P. Trotter, Furnivals Inn, County of Middlesex, Eng.

330,367. FASTENER FOR MEETING-RAILS OF SASHES.—James M. Atwood, Plymouth, Mass.

330,369. WRENCH.—George A. Barnes, New Haven, Conn.

330,371. SASH-BALANCE. — Oscar Beebe, Hornellsville, N. Y.

330,374. ADJUSTABLE DERRICK.—Anthony P. Cadden, Baltimore, M. D.

330,375. BLACKBOARD COMPOSITION.—Loren Chadwick, Battle Creek, Mich.

330,376. ROCK-DRILLING MACHINE. — William H. Clark, What Cheer, Io.

330,378. COMBINED BEVEL, MITER AND TRY-SQUARE.—Samuel S. Colt, Orange, N. J.

330,400. VAULT COVER AND VENTILATOR.—August W. Herr, Chicago, Ill.

330,410. CISTERN CUT-OFF. — George W. Lawbon, and William Lawbon, Knoxville, Tenn.

330,414. GLAZIER'S POINT.—Edwin J. Van Reyper, Jersey City, N. J.

330,462. HEATING APPARATUS FOR BUILDINGS. — Stephen Bradley, New Haven, Conn.

330,464. INCANDESCENT ELECTRIC LIGHTING. — Harold P. Brown, Chicago, Ill.

330,486. LIGHTING-ARRESTER. — Arthur J. Holt, Cleveland, O.

330,489. ROCK-DRILL. — Sylvanus Hussey, Silver Creek, N. Y.

330,502. CONNECTION FOR PIPES TO CLOSETS, ETC. —Samuel G. McFarland, New York, N. Y.

330,508. REAMER.—James Neale, Bridgeport, Conn.

330,516. FIREPLACE AND HEATING-STOVE.—Sam'l Little Marylebone Street, Reeve, County of Middlesex, England.

330,524. WATER-FAUCET. — Atkins Stover, Brooklyn, N. Y.

330,529. SEWER-GAS TRAP. — William G. Thompson, New York, N. Y.

330,538. PIPE-VISE.—John S. Woolsey, Gilroy, Cal.

330,546. CLAMP FOR ROOF-SCAFFOLDS, ETC.—Aurelius T. Barlow, Marshfield, Oreg.

330,555. PAINT-MIXER.—Frederick Brandenberger, Danville, Ill.

330,563. DOOR-STRIP. — William Clark, Lincoln, Nebr.

330,574. SINGLE-PIECE PORCELAIN WASH-OUT WATER-CLOSET.—Alfred Fowkes, Philadelphia, Pa., and Thomas Connolly, Trenton, N. J.

330,591. SASH-LOCK. — William Lang, New York, N. Y.

330,594. WRENCH. — Samuel J. Lea, Chattanooga, Tenn.

330,602. MANUFACTURE OF CEMENT. — Henry Mathey, New York, N. Y.

330,614. MACHINE FOR SAWING STONE. — James Peckover, Philadelphia, Pa.

330,624. TUBE-JOINT FOR GAS-CONDUITS.—W. Lucien Scaife, Allegheny, Pa.

330,633. HEATING-DRUM AND VENTILATOR. — John Springer, Clinton, Wis.

330,638–642. REVOLVING-TOWER SYSTEM OF FORTIFICATIONS.—Theodore R. Timby, Nyack, N. Y.

330,643. TAIL-SCREW FOR CARPENTERS' BENCHES. —Conrad Ungermann, Dayton, O.

330,679. PLUMBER'S TRAP. — Patrick J. Clancy, Danvers, Mass.

330,683. TRAP FOR WASH-BASINS, ETC.—Robert B. Dick, Philadelphia, Pa.

330,696. STEAM-RADIATOR. — Thomas P. Hardy, New York, N. Y.

330,703. HANGER FOR PIPES.—James Hoey, Brooklyn, N. Y.

330,706. WATER-CLOSET. — Jesse L. Hutchinson, Baltimore, Md.

330,741. SHUTTER-FASTENER.—Fred. C. Robinson, New York, N. Y.

330,750. ELEVATOR. — William Stevens, Philadelphia, Pa.

330,769. WEATHER-STRIP.—John Y. Bassell, Leesburg, Va.

330,802. SASH-LOCK.—Edward T. Prindle and Frederic C. Baird, Aurora, Ill.

330,828. GLAZIER'S POINT.—Hiram W. Eames, Milford, Mass.

330,837. POCKET-RULE.—Henry Judd, West Cheshire, Conn.

330,843. WATER-CLOSET VALVE. — Henry S. Lord, Hartford, Conn.

SUMMARY OF THE WEEK.

Baltimore.

BANK.—Henry Brauns, architect, has prepared plans for a three-st'y pressed-brick building, with granite base and Cheat River bluestone and terra-cotta trimmings, 17′ 6″ x 85′, for the Border State Savings Bank, with dwell. for cashier over, to cost $11,000.

DWELLINGS.—Wm. L. Stork, Esq., is to have built 15 Hummelstown brown-stone and Rockface marble front buildings, 18,′ 19′ x 21′ x 70′ on North Calvert St., bet. Biddle and Preston Sts., to cost, $90,000; from designs by Henry Brauns, architect.

BUILDING PERMITS. — Since our last report nineteen permits have been granted, the more important of which are the following: —

Smith & Wilbur, 12 two-st'y brick buildings, w s Patapsco St., bet. Fort Ave. and Clement St.

Degenhardt & Preisinger, 3 two-st'y brick buildings, e s Holland Alley, n Biddle St.

Elias Hahn, 9 three-st'y brick buildings, n s Mosher St., bet. John St. and Rutter Alley.

Henry S. Fink, 4 two-st'y brick buildings, w s Carey St., n Patterson Ave.

Geo. Bunnecke, 6 two-st'y brick buildings, s s St. Peter St., com. s w cor Parkin St.; and 2 two-st'y brick buildings, w s Parkin St., s St. Peter St.

W. P. Clothworthy, 8 two-st'y brick buildings, e and w s Parrish Alley, s Presstman St.

Chas. Duncan, 3 two-st'y brick buildings, n s Columbia Ave., com. n e cor. Collender Alley; and 4 two-st'y brick buildings, s s Lorman Alley, in rear.

Henry Warner, three-st'y brick building, w s Pennsylvania Ave., bet. Smith and Pitcher Sts.

Conrad Kurtz, etc., 4 three-st'y brick buildings, w s Greene St., com. s w cor. Mulberry St

S. S. Clayton, 3 two-st'y brick buildings, w s William St., s Cross St.

G. L. Dunkerly, 11 three-st'y brick buildings, s s Lanvale St., bet. Barclay St. and Falls Alley.

Morgan & Bro., 2 two-st'y brick buildings, w s Goodman Alley, in rear e s Hanover St., bet. Cross and Hamburg.

Boston.

BUILDING PERMITS. — *Wood.* — *Copeland St., No. 27*, dwell., 21′ x 35′; owner and builder, W. Donaldson.

East Sixth St., Nos. 475–477, dwell., 15′ x 29′; owner and builder, J. V. Devine.

Washburn St., near Dorchester Ave., dwell., 22′ x 30′; owner and builder, F. C. Sands.

East Fifth St., Nos. 423–425, dwell., 22′ x 38′; owner, Julia W. Howe; builder, H. Harlow.

Georgia St., opp. Maple St., dwell., 34′ x 38′; owner, J. F. Menden; builder, D. W. Belcher.

Copeland St., No. 23, dwell., 23′ x 34′; owner, J. S. Brickett; builder, A. G. Strout.

Beale St., near Railroad, dwell., 23′ 6″ x 28′; owner, John Humphrey; builder, H. P. Oakman.

Emerson St., Nos. 111–117, dwells., 23′ x 40′; owner, Trustees Hawes & Feind; builder, W. T. Eaton.

Coleman St., near Hamilton St., dwell., 22′ x 34′; owner and builder, C. H. Wetmore.

Saratoga St., No. 696, dwell., 20′ x 28′; owner and builder, E. J. Turner.

Brooklyn.

BUILDING PERMITS. — *Cedar St.*, n s, 300′ e Evergreen Ave., three-st'y frame tenement, tin roof; cost, $4,000; owner, P. H. Hill, 771 Madison St.

Fifty-fifth St., s s, 200′ e First Ave., 3 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $1,700; owner, Levi V. Martin, 87 Fifty-fifth St.; architect, H. L. Spicer; builder, J. H. French.

Halsey St., No. 80, s s, 100′ w Nostrand Ave., three-st'y brick dwell. and extension, tin roof; cost, $7,000; owner and builder, W. R. Bell, 403 Washington Ave.; architect, C. A. Mushlit.

Degraw St., n s, 100′ e Rogers Ave., three-st'y brick tenement, gravel roof; cost, $3,500; owner and builder, John R. Ferguson, 917 Douglass St.; architect, A. Hill.

Bergen St., s s, about 105′ w Brooklyn Ave., two-st'y brick stable and rooms over, tin roof; cost, $4,000; owner, A. S. Barnes, 755 St. Marks Ave.; architect, A. G. Stone.

Madison St., n s, 255′ w Sumner Ave., two-st'y brick stable, gravel roof, wooden cornice; cost, $7,500; owner, architect and builder, Paul C. Grening, 420 Gates Ave.

Halsey St., n s, 232′ w Stuyvesant Ave., 12 three-st'y brick and brown-stone dwells., gravel roofs; cost, each, $5,000; owner, Joseph P. Puels, 113 Nostrand Ave.; architect, J. D. Hall; builder, W. Andrews.

Dean St., s s, 175′ w Franklin Ave., two-st'y brick engine-house, gravel roof; cost, $12,000; owner, Budweiser Brewing Co., Dean St., Franklin Ave.; architect, J. Platte; builder, J. Rauth.

Myrtle Ave., n e cor. Franklin Ave., four-st'y brick store and tenement, tin roof; cost, $12,000; owner, James Ward, 325 Bedford Ave.; architect, J. Platte; builder, P. Newman.

Warren St., n s, 100′ w Nevins St., 2 four-st'y brick tenements, tin roofs; cost, $14,000; owner, P. O'Rourke, 419 Degraw St.; architect, —— Reagan; mason, J. H. O'Rourke.

Bushwick Ave., w s, 50′ s Suydam St., two-st'y (brick-filled) frame dwell., tin roof; cost, $3,000; owner and architect, John Kramer; builder, J. Rueger.

Sumpter St., n s, 250′ e Saratoga Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,500; owner and builder, Nicholaus Burkhardt, 338 East Eighteenth St.; architect, H. Vollweiler.

George St., n s, 120′ e Central Ave., one-st'y and five-st'y brick brewery and boiler-house, tin roofs; cost, $30,000; owner, Leonard Eppig, George St.; architect, C. Stoll.

Fourth Ave., n w cor. Fifty-third St., 8 two-st'y frame (brick-filled) dwells., tin roofs; cost, $16,000; owner, James Weir, Jr., Twenty-fifth St., near Fifth Ave.; architect, F. Ryan; builders, D. Ryan and J. Goodwin.

Fourth Ave., n w cor. Forty-eighth St., three-st'y frame store and dwell., tin roof; cost, about $2,500; owner and contractor, James Montgomery, 993 Third Ave.; architect, W. H. Wirth.

Stanhope St., n w s, 465′ n e Evergreen Ave., 3 two-st'y frame dwells., tin roofs; cost, $2,700; owner and builder, John Mitchell, 76 Conselyea St.; architect, W. Clement.

Herkimer St., n s, 112′ e Kingston Ave., 6 two-st'y brick dwells., tin roofs; total cost, $21,000; owner and contractor, H. J. Brown, 99 Decatur St.; architect, A. Hill.

Eighth St., s s, 150′ e Third Ave., 3 two-st'y brick factories, tin roofs; cost, $4,500; owners, Chas. S. Higgins & Co., 197 Third St.; architects and builders, Maurice Freeman's Sons.

Macon St., n s, 21′ w Sumner Ave., two-and-a-half-st'y brick dwell., tin roof; cost, $5,000; owner, A. K. Buckley, 890 Gates Ave.; architect, W. H. Burhaus.

Macon St., n w cor. Sumner Ave., four-st'y brick store and flat, tin roof; cost, $12,000; owner and architect, same as last.

Saratoga Ave., w s, 98′ s Herkimer St., two-st'y frame dwell., tin roof; cost, $2,800; owner; W. J. Courter, 706 Herkimer St.; architect and contractor, G. Marriott; mason, W. Wickes.

Schenck St., No. 208, three-st'y brick tenement, tin roof; cost, $4,500; owner, Earl C. Marsh, 208 Schenck St.; architect, A. Hill.

Hancock St., n s, 95′ e Tompkins Ave., 10 three-st'y brick dwells., tin roofs; cost, each, $8,000; owner and architect, J. C. Bashfield, 593 Herkimer St.; builder, not selected.

Tenth St., s s, 82′ w Seventh Ave., 4 two-st'y brick dwells., tin roofs; total cost, $17,000; owner, architect and builder, John Kolle, 141½ Twenty-second St.

Sixteenth St., s s, 300′ e Fifth Ave., three-st'y frame (brick-filled tenement, tin roof; cost, $4,000; owner, James Doyle, Sixteenth St., near Fifth Ave.; architect and builder, W. J. Conway.

Chicago.

BUILDING PERMITS. — A. A. Holden, 3 three-st'y stores and flats, 795 and 797 West Madison St.; cost, $15,000; architect, S. V. Shipman.

Reid, Murdock & Fisher, four-st'y factory, 530-536 West Lake St.; cost, $30,000; architect, S. V. Shipman.

F. Lode, three-st'y dwell., 95 Judd St.; cost, $4,600.

H. Corwith, 2 three-st'y store and flats, 496 and 498 West Madison St.; cost, $20,000.

Andrews, Burhaus & Cooper, 5 two-st'y dwells., 3221-3229 Rhodes Ave.; cost, $20,000.

J. Ideler, two-st'y dwell., 923 Polk St.; cost, $3,500.

M. Myers, additional story, 73 and 75 East Chicago Ave.; cost, $4,500.

A. Johnson, 2 three-st'y stores and flats, 129 and 131 Ontario St.; cost, $10,000.

Chicago, Milwaukee & St. Paul R. R. Co., two-st'y warehouse, Kinzie and Kingbury Sts.; cost, $50,000.

G. Wetterlund, 2 three-st'y dwells., 149 and 151 North Carpenter Sts.; cost, $8,800.

C. Oberg, four-st'y dwell., 204 West Ohio St.; cost, $6,000.

C. E. Robinson, three-st'y store and flats, 515 Clark St.; cost, $9,000.

P. Ryan, two-st'y store and dwell., 516 Thirteenth St.; cost, $3,300.

W. Comstock & Co., two additional stories, 127 and 129 Ontario St.; cost, $3,000.

C. B. Simons, two-st'y dwell., 3717 Johnson Pl.; cost, $2,500.

C. Hild, three-st'y dwell., 348 Dayton St.; cost, $5,500.

G. W. Cook, two-st'y dwell., 2951 Groveland Ave.; cost, $5,000; architect, W. L. B. Jenney.

E. Bassler, two-st'y dwell., 163 Wood St.; cost, $4,000.

L. Silverman, four-st'y factory, 1234-1250 Filmore St.; cost, $40,000; architect, O. Cobb.

E. F. Ingals, 2 two-st'y dwells., 503 and 507 West Adams St.; cost, $15,000.

The Union League Club, six-st'y club-house, 104-114 Jackson St.; cost, $150,000; architect, W. L. B. Jenney.

G. S. Chapin, three-st'y dwell., 3626 and 3628 Michigan Ave.; cost, $35,000; architect, F. L. Charnley.

M. Keating, 2 two-st'y dwells., 3141 and 3143 Vernon Ave.; cost, $10,000.

J. S. Hoskins, four-st'y dwell., 87 Thirty-first St.; cost, $12,000.

M. Cohen, three-st'y club-house, 531 and 533 Wells St.; cost, $12,000; architects, Fromman & Jebsen.

M. Dix, two-st'y addition 28-36 Rush St.; cost, $7,000.

F. R. Otis, two-st'y addition, 12 Quincy St.; cost, $3,000.

President Theological Seminary of the Northwest, 5 two-st'y dwells., 312-320 Belden Ave.; cost, $20,000.

W. S. Edwards, two-st'y factory, 73-83 North Ashland Ave.; cost, $5,500.

J. J. Smith, two-st'y store and dwell., 3658 Butterfield St.; cost, $3,300; architect, H. C. Hanson.

P. Dougherty two-st'y dwell., 187 Osgood St.; cost, $3,000; architect, O. Burgeois.

P. W. Gates, three-st'y dwell., 542 Washington Boulevard; cost, $4,000; architect, W. Thomas.

Garner & Co., 3 two-st'y dwells., 3108 Hanover St.; cost, $6,000.

J. Weisbach, two-st'y dwell., 950 Halsted St.; $3,500.

C. Reimer, two-st'y dwell., 661 North Ashland Ave.; cost, $6,000.

M. Rothe, two-st'y dwell., 63 Tell Pl.; cost, $5,000; R. Gerber, two-st'y dwell., 267 North Wood St.; cost, $5,000.

F. Novak, 6 dwells., 366-378 Loughton St.; cost, $4,000.

S. Schutt, two-st'y flat, 121 Seminary Ave.; cost, $3,000.

R. S. Cox, 6 three-st'y stores and dwells., Jackson St.; cor. Wood St.; cost, $26,000.

Wesley M. E. Church, two-st'y parsonage, 1009 North Halsted St.; cost, $4,500.

N. W. Parlor M'f'g Co., two-st'y addition; cost, $2,800.

S. C. Hayes, two-st'y flats, 763 Walnut St.; cost, $4,000.

J. Thollen, two-st'y flat, 2458 Dearborn St.; cost, $7,000.

F. Mobinke, two-st'y flat, 294 Henry St.; cost, $35,-000.

H. Neff, two-st'y store and dwell., 183 West Van Buren St; cost, $4,000.

J. Clark, 3 two-st'y dwells., 3123-3125 Michigan Ave.; cost, $11,000.

J. O'Boyle, three-st'y store and dwell., 58 North State; cost, $6,000.

A. Biemolt, three-st'y store and dwell., 567 West Harrison St.; cost, $6,000.

H. Schollkopt, 8 two-st'y dwells., 802-810 North Park St.; cost, $17,000; architect, T. Karls.

H. Schollkopt, 4 two-st'y dwells., 906-912 North Clark St.; cost, $17,000.

D. S. Googins, 2 two-st'y dwells., 41-43 Oak Ave.; cost, $18,000.

Cincinnati.

BUILDING PERMITS.—J. A. Williams, remodel three-st'y brick house, Race St., bet. Union and Pearl Sts.; cost, $3,500.

Henry Slater, double frame dwell., 682-684 Eastern Ave.; cost, $2,000.

Mrs. Vevay, two-st'y frame dwell., Hackburn and Dexter Sts.; cost, $4,500.

Geo. W. Clark & Bro., three-st'y brick dwell., Halstead & Eliza Sts.; cost, $4,500.

L. Seasongood, five-st'y stone front building, 374 West Sixth St.; cost, $7,500.

Total cost to date, $2,120,044.

Last permit, 5562.

Denver, Col.

BUILDING PERMITS. — F. A. Knight, two-st'y brick dwell., Pearl St.; cost, $8,000; Wm. Quayle, architect.

John Mellor, dwell. and barn, Pearl St.; cost, $6,500; Fred. Hale, architect.

W. C. Ellis, brick dwell., Pearl St.; cost, $4,000; D. M. Orr, architect.

H. K. Steele, two-st'y brick dwell.; cost, $8,000; R. S. Roaschlub, architect.

J. W. Sanderson, two-st'y brick dwell., Pearl St.; cost, $3,500 Fred. Hale, architect.

F. Jerome, two-st'y brick dwell., Sherman Ave.; cost, $8,000; Wm. Quayle, architect.

W. H. James, two-st'y brick dwell., Sherman Ave.; cost, $17,000; Kinzie, builder.

F. A. Burnel, two-st'y brick dwell., Kansas Ave.; cost, $6,000; W. H. J. Nichols, architect.

ALTERATIONS. — Opera-House Block, repairs and alterations; cost, $5,000.

McPhee & McGinnity, repairs; cost, $4,000.

A. Cooper, two-st'y brick addition; cost, $7,000; Edbrooke & Co., architects.

Phil. Zang, addition to brewery; cost, $30,000; F. C. Eberley, architect.

Kansas City, Mo.

BUILDING PERMITS. — John Gray, two-and-one-half-st'y brick and cut-stone building, 40′ x 60′; cost, $15,-000.

A. M. Sills, two-st'y brick and cut-stone buildings, 24′ x 43′; cost, $3,500.

Temple & Fillmore, two-st'y frame building, wood and stone foundations, 32′ x 84′; cost, $4,800.

New Haven, Conn.

BUILDING PERMITS. — Following are the permits for new buildings issued since last report: —

George St., near Orchard St., dwell., 26′ x 50′; cost, $3,300; owner, Edward W. Baldwin.

Shelton Ave., two-st'y frame dwell., 30′ x 40′; cost, $3,000; owner, Emil Matthies.

York Square, near Broadway, two-st'y brick dwell., slate roof, 30′ x 50′; cost, $6,000; owner, E. B. Richardson.

Dixwell Ave., near Brewster St., 2 two-st'y buildings, 16′ x 25′, owner, Howard Maine.

Winchester Ave., near Division St., 3 two-st'y frame dwells., 21′ x 37′; cost, $5,000; owner, Wm. A. Lincoln.

Congress Ave., No. 42, iron store, 18′ x 40′; owner, R. M. Burwell.

State St., near East St., three-st'y frame dwell., two tenements, 40′ x 50′; cost, $5,000; owner, John Shuster.

Lynwood St., No. 26, two-st'y brick dwell., 25′ x 43′; cost, $3,500; owner, Emma R. Barnes.

Congress Ave., near Meadow St., three-st'y brick dwell., 42′ x 52′; cost, $9,000; owner, Moses Thomas.

Derby Ave., near Chapel St., 2 two-st'y frame dwells., 17′ x 25′; owner, Dean Cobb.

Hughes Pl., two-st'y brick dwell., 24′ x 43′; cost, $3,000; owner, Horace J. Morton.

Nicoll St., 2 two-st'y frame dwells., 18′ x 36′, 25′ x 40′; owner, B. F. Mansfield.

Artizan St., No. 24, three-st'y brick factory, 30′ x 40′; owner, Chas. R. Brown.

New York.

CHURCH.—The United Evangelical Brethren propose to build a church on the n s of Sixty-seventh St., 325′ w of Fourth Ave.

FLATS.—Sixteen tenements are to be built on Ave. A, running from the n e cor. of Eighty-seventh St. to the s e cor. of Eighty-eighth St., at a cost of about $186,000, from plans of Mr. John Brandt.

HOUSES. — On the w s of Madison Ave., running from One Hundred and Twenty-seventh St. to One Hundred and Twenty-eight St., 12 four-st'y and basement brick, stone and terra-cotta houses, 20′ x 35′ each, are to be built at a cost of $120,000, for Mr. George Kuhn, from plans of Mr. A. I. Finkle.

On the n e cor. of Riverside Drive and One Hundred and Fourth St., a handsome house, 36′ x 95′, is to be built for Dr. B. S. Bacon, at a cost of $115,000, from plans of Mr. Jos. M. Dunn.

On the w s of Lexington Ave., running from One Hundred and First to One Hundred and Second St., 12 three-st'y and basement brick, stone and terra-cotta houses, 16′ 8″ x 48′ each, with extension 15′ x 15′, are to be built from plans of Mr. Andrew Spence.

Philadelphia.

BUILDING PERMITS.—*Sixth St.*, e s, s of Norris St., 6 three-st'y dwells., 14′ x 59′; T. W. Small, owner.

Archer St., e s, s of Greene St., 2 two-st'y dwells., 16′ x 32′; A. B. Levis, owner.

Twenty-third St., s e cor Clarence St., two-st'y dwell., 14′ x 28′; P. Haley, owner.

Third St., n of Cumberland, three-st'y dwell., 18′ x 57′; M. Branigan, owner.

Carnarvon St., n of Tasker St., 4 two-st'y dwells., 15′ 6″ x 28′; Steinbach & Co., contractors.

Cymro St., n of Tasker St., 4 two-st'y dwells., 15′ 6″ x 28′; contractors, same as last.

Fiftieth St., s of Torr Ave., 2 two-st'y dwells., 14′ x 28′; R. Dothart, contractor.

Marshall St., w s, n of Thompson St., 2 three-st'y dwells., 18′ x 60′; L. Koder, contractor.

Fairhill St., above Cumberland St., one-st'y warehouse, 50′ x 60,; Einwichter & Son, contractors.

Richmond St., n of Tioga St., one-st'y boiler-house, 30′ x 35′; Einwichter & Sons, contractors.

Mountain St., w of Eighteenth St., addition to factory; M. A. Furbish & Sons, contractors.

Sixth St., s of Morris St., stable; Geo. C. Jackson, contractor.

Canal St., No. 1027, one-st'y boiler-house; E. Schmidt, contractor.

Fifth St., n of Lehigh Ave., two-st'y factory; Jno. Scheiber, contractor.

Orkney St., n of Lehigh Ave., two-st'y factory; contractor, same as last.

Clover St., w of Twelfth St., six-st'y factory, 35′ x 95′; Wilber & Sons, owners.

Swanson St., e s, s of Catharine St., four-st'y factory, 50′ x 100′; Lewis Havens, contractor.

Darien St., cor. Huntingdon Sts., 2 three-st'y dwells., 15′ x 48′; A. D. Kennedy, owner.

Sixth St., s of Tasker St., three-st'y store, 16′ x 42′; David France, contractor.

Hoffman St., w of Sixth St., 2 two-st'y dwells., 14′ x 28′; W. F. Albrecht, owner.

Hazel St., w of Sixtieth St., two-st'y dwell., 16′ x 30′; Jacob Fell, contractor.

Sixtieth St., cor. Baltimore Ave., two-st'y dwell., 16′ x 30′; contractor, same as last.

Third St., n of Cumberland St., one-st'y dwell., 15′ x 30′; Hey Bros., owners.

Pine St., No. 1203, three-st'y addition, 14′ x 39′; O. H. Mann, contractor.

Bala Station, three-st'y dwell., 30′ x 60′; F. Thurwagen, contractor.

Vine St., e of Fifty-eighth St., two-st'y dwell., 16′ x 44′; Jno. Sheehan, owner.

Twenty-sixth St., s of Thompson St., 2 three-st'y dwells., 17′ x 45′; Harbach & Auchter, contractors.

Elmwood St., w of Eighty-sixth St., two-st'y dwell., 16′ x 36′; Frank Berry, contractor.

North Third St., No. 1168, two-st'y stable, 14′ x 24′; B. Ketcham, contractor.

St. Louis.

BUILDING PERMITS.—Forty-seven permits have been issued since our last report, eleven of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Fred. Glasser, two-st'y double brick dwell.; cost, $3,100; Paulus & Weidemuller, contractors.

H. Grove Brewing Co., two-st'y brick refinery machine-house; cost, $7,000; E. Jungenfeld & Co., architects; sub-let.

John Bauer, 3 adjacent brick tenements; cost,



METROPOLITAN OPERA-HOUSE, NEW YORK, N. Y.

Heliotype Printing Co., Boston.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 519.

DECEMBER 5, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THERE is, as we believe, no department of the Government which is managed with more unselfish zeal than the Bureau of Education, and its work has, in consequence, been conspicuously useful to the public to which it is addressed. Most teachers worthy of the name become almost passionately fond of their work, and, mainly through the facilities for the interchange of ideas which their *esprit de corps* and general intelligence afford, their profession has become, in this country particularly, one of the most active and progressive of all. Several years ago the Bureau of Education, which enjoys the advantage of the widest possible outlook, so to speak, over the field which it occupies, perceived the importance which industrial training was soon to take in the educational systems of all civilized nations, and, employing a part of its resources in the collection of facts on the subject, published several interesting tracts relating to it. These tracts have done much to open the way for the movement for such education which is already gaining headway here; and the Bureau, having accomplished so much, has again taken the lead in developing the general idea by the study of details. No one looks far into the various schemes for industrial training already in operation here and abroad without finding that instruction in drawing is the basis of every one of them, whether they relate to the general subject or to special branches; and the Bureau, quickly discovering this, was wise enough to undertake, as its next duty, the preparation of a tract not only showing, by the collation of foreign and domestic examples, the importance of the subject, but showing in the same way how drawing, such as industrial schools need, is actually taught in the best and most efficient of these schools. This work has been going on for many months, and we are glad to learn that the book is now nearly ready for distribution. Unless we are much mistaken, it will prove one of the most valuable auxiliaries yet found to the complete solution of the problem of education which is becoming the most important one of our time.

A PARTICIPATION scheme, having according to the accounts in the newspapers, a rather hasty and ill-digested air, is said to have been devised by a rich brewer in Ohio, who has resolved to transfer his business to a corporation, with a capital stock of eight hundred thousand dollars, of which he will himself hold one-half, while the remainder will be divided among his agents and employés, whether as a gift, or in return for gradual contributions out of their wages, does not appear. In any case, the plan seems to be a kind and generous one, and there is comfort in the reflection that good intentions are never wholly wasted; but it would be hard to devise anything more demoralizing to a body of workmen than to divide nearly half a million dollars' worth of property suddenly among them, and instal them as equal proprietors in a business of the administration of which they knew scarcely the smallest detail. The reason given by the papers for Mr. Finley's decision is that he "proposes now to help the men who stood by him, and helped him to earn his wealth," all of which is absurd claptrap. If he wishes to help the men with whom he has been associated so long, he can do them more good by showing them how he saved and invested his first five-dollar bill, and by teaching them to do the same, than by presenting them with a million dollars apiece; and he must be a much less intelligent business man than we take him to be if he does not know this. If he can go farther, and teach his men how to administer the business of which they now know only the technical portion, he will do still more for their prosperity, for if anything can assure a man's welfare, it is the combination of technical and commercial skill in regard to a given subject; but the communication of the latter is one of the most difficult tasks which men of real benevolence have ever undertaken. The number of large establishments in the world where the employed participate successfully with their employers in the management as well as the profits of their business can be counted on the fingers of one hand, and if Mr. Finley can carry out his generous intentions with so much discretion as to secure not only the good results which have been achieved in these establishments, but something in addition, he will take rank as the benefactor, not of his workmen alone, but of mankind.

THE most scientifically-fitted, as well as one of the prettiest theatres in the world, excepting always the Lyceum and the Madison Square Theatre in New York, seems, to judge from the illustrations and description given in *Le Génie Civil*, to be the new opera-house at Buda-Pesth. Considering that Buda-Pesth is only a short distance from the Turkish frontier, and was itself a Turkish town less than two hundred years ago, it is always a little surprising to hear of its successive achievements in the arts of civilization; but it has of late years become a rich and important city, as well as a very pleasant one. The principal façade of the new opera-house is of cut-stone, with brick, covered with stucco in the German manner, for the less conspicuous portions of the exterior. The interior is mainly in marble. Although the theatre is a large one, it provides seats for only twelve hundred and sixty-seven spectators, but these are most comfortably accommodated. It is hardly necessary to say that the whole building is as nearly fire-proof as iron and stone can make it. Two curtains of corrugated-iron separate the stage from the auditorium. One of these serves for the drop-curtain, and is shown frankly as metal, the border only being decorated. It is supposed, with some reason, that the sense of security imparted to the minds of the audience by the sight of the iron screen will compensate for the lack of artistic effect; and the curtain is intended to be a very efficient affair, the edges being packed almost air-tight, so as to exclude all smoke from the auditorium in case of fire on the stage. The stage and work-rooms are warmed by hot water, and the auditorium by steam, and the latter is ventilated very thoroughly by means of fans, every seat having a register. The theatre is lighted by gas, three thousand seven hundred and ninety-eight burners being used. It was intended to employ incandescent electric lamps instead of gas-jets, and ground was actually secured near by for a building to contain the necessary machinery, but the patentees demanded the modest sum of two hundred and twenty-five thousand dollars for introducing the incandescent lamps into the building, and the management concluded to go without them. There are, however, on the stage sixteen arc lights, of twelve hundred candles, each, operated by gas-engines.

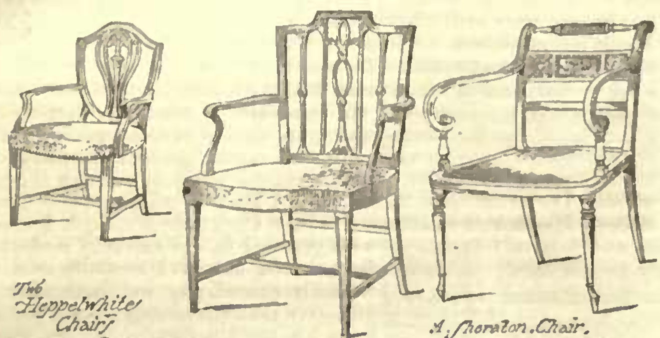
THE most interesting portion of the theatre is, however, the stage, with its apparatus for managing the scenery, which differs from that used in any other building of the kind. The whole of the fittings were provided by a corporation known as the Asphaleia Company, at a cost of about a hundred and thirty thousand dollars, and have proved so satisfactory that very similar ones are now being placed in a new theatre at Halle. So far as the scenery is concerned, the stage, on the new system, presents an appearance differing completely from that of the ordinary theatre. There are no wings, no set scenes, no *coulisses*, or grooves for the scenes to run in, no sky borders and, in general, no trace of that succession of flat fragments of

canvas which have for so many years been employed to represent the perfection of nature. As a substitute for these the Asphaleia Company begins by hanging a curtain around the stage, forming three sides of a square, the open side of which nearly reaches the proscenium wall. This curtain, which is more than five hundred feet long, and fifty-five feet high, moves freely in a horizontal direction, and is painted with atmospheric effects of all varieties, from a serene sky to the wildest storm. It is of semi-transparent material, and by turning suitable cranks, and varying the lights behind the curtain, which is known as the "horizon," the scene can be made to pass imperceptibly from clear daylight to brilliant sunset and stormy night, or through any other desired transitions. The lower edge of the horizon curtain is six and one-half feet from the stage floor, so that the actors pass easily under it, and it can be raised entirely out of sight if necessary. The obvious advantage of this arrangement is that the sky, and indeed the scene in general, has the same appearance from all parts of the house, instead of resolving itself, as soon as the spectator leaves the centre of the auditorium, into a series of pasteboard edges, terminating horribly distorted pictures of trees and houses. Under the Asphaleia system, the latter objects, except in certain cases, as in the flats at the end of the stage, are not painted as flat surfaces, but are detached pieces, brought up from below through trap doors as they are needed. Besides the improvement in the scenic effect, the abolition of the *coulisses* gives more real freedom of movement on the stage, and facilitates greatly the setting of the scenes; so that it is said that all the elaborate scenery of the opera of Faust was managed in this theatre with sixteen men on the stage, six below and one above; while at the Opera-House in Vienna, where the stage is of the same size, from eighty to one hundred men are required for the same work. Another novelty is in the arrangement of the stage floor, the whole of which is divided into traps, large and small, except a strip seven feet wide just behind the foot-lights, which is furnished only with two circular traps at the ends, and another for the prompter. All the traps are moved by hydraulic presses, and are readily controlled from a single point. If desired, the whole or any part of the stage can be raised above its usual level by the same means; or one part only may be raised so as to convert it into a hill or mountain side. The whole cost of the theatre, including the stage machinery, with an outfit of scenery and costumes, was sixteen hundred thousand dollars.

A GOOD deal of talk has been made lately about a new scheme, or, rather, a revival of an old scheme, for changing the climate of the North-eastern States of the Union by building a dam across the Strait of Belleisle, between Labrador and the north-eastern part of Newfoundland. It is well known that a current of cold water flows from the Arctic Ocean southward along the eastern coast of this country, between it and the Gulf Stream, the latter being deflected by it toward the western shore of the British Isles, to which its warm waters give a climate resembling in temperature that of Bermuda, and the theory of the plan is, that if the Strait could be closed, the Arctic current would be intercepted, and diverted from the shores of Maine and Massachusetts to those of Europe. Unfortunately, the Strait of Belleisle is but ten miles wide, and about one hundred and fifty feet deep, at the narrowest part, and although it would not be a very serious matter to close it, the prospect that the stoppage of so small an opening would affect the vast ocean currents in such a way as to make a material change in the climate of a continent seems rather remote. If we recollect rightly the physical geography which we studied at school, the water carried north by the Gulf Stream all flows back again southward through the Arctic currents. It is true that a great part of the cold current is buried, so to speak, beneath the warmer one which flows in the contrary direction over it; but the Gulf Stream opposite New York is somewhere about four hundred miles wide, and the influence upon it of the little stream through the Strait of Belleisle must be comparatively insignificant. If any one is disposed to undertake engineering operations for the purpose of changing the North American climate, the enlargement of Behring's Strait appears to offer by far the most favorable field. Every one who reads the weather indications knows that our coldest winds all come from the north-west coast of the continent, and any amelioration of the climate of Alaska would be felt over the entire territory east of the Rocky Mountains, from Halifax to Florida. Now, there is in the Pacific a warm current, much more extensive than the Gulf Stream, and quite as warm, which flows from the China Sea past Japan to the north-east, where it is deflected by the point of Alaska, and returns around the Siberian coast. A small stream of warm water gets through Behring's Strait, but this is narrow, and much encumbered with rocky islets, so that the amount is insignificant. If, however, the islets could be removed, so as to give room for the warm water to pass, a decided influence would, it is thought, be produced on the northern coast of Alaska, much to the advantage of that territory, as well as of the rest of the United States. As the warm current would in any case be a superficial one, it might, perhaps, only be necessary to blow up the islets, and let the *débris* fall into the channel, which is about two hundred feet deep, and would give room for them without much obstruction to the desired movement of the water.

A NEW sort of tubular-boiler is described in a late number of *Le Génie Civil*, which promises to have important advantages. Every one knows something of the boilers at present in use, composed either of pipes placed vertically, or nearly so, around the fire, and connected at their upper and lower ends, or of sets of pipes placed at a slight angle with the horizon, and connected at the top with a steam drum. These boilers heat very quickly, and are much used for high pressures and quick-working engines, but the water is boiled with such rapidity in the tubes which constitute them that the steam is apt to be mixed with fine spray; and in those with vertical tubes a cessation of the circulation is sometimes followed by the accumulation of sediment in the bottom of the tubes in sufficient quantity to obstruct them; while the boilers of the latter class are less economical of coal than those in which the heating surfaces are horizontal. The new boiler, which *Le Génie Civil* calls the "Bristle," of M. Hervier, avoids all these defects by combining horizontal heating pipes, not merely with a steam drum, but with a reservoir so arranged as to prevent the priming common to pipe-boilers. The reservoir is nothing more than a vertical, riveted boiler of the simplest kind, tapped at the lower portion for the heating tubes, which may be inserted at one side only, or all around, as best suits the arrangement of the fire-box. From three to twenty rows of short tubes are inserted, according to the size of the boiler, and the power of the fire, and the pipes are "staggered" so as to utilize as much as possible of the heat from the burning gases which circulate among them. The heating tubes, which are closed at their outer ends, are not connected among themselves in any way, but are simply screwed, one by one, into the shell of the boiler. Inside the boiler, extending upward from near the bottom as far as the top row of heating pipes, is an inner shell of plate iron, just strong enough to admit of tapping for a second set of tubes, about half the diameter of the first and open at each end, which are so set into the inner plate that each projects into one of the larger closed tubes, nearly to the end. As soon as the lining shell has been set in place, and the small tubes screwed into it, and the larger closed tubes then put on over them, and screwed into their places in the outer shell, the boiler is ready for use. Filling it half full of water, and lighting a fire under the heating tubes, a circulation is at once set up. The cold water which fills the space inside the inner shell passes out through the small tubes into the extreme ends of the heating tubes, and thence back, through the latter, strongly heated, and filled with bubbles of steam, to the space between the outer and inner shells of the boiler. Here the bubbles of steam, issuing from the tubes, strike upon the lining plate, and are so broken up as to lose in some degree their power of carrying over water with them, returning to something like the condition of the steam-bubbles in a boiler of the ordinary kind in moderate action; and, rising then to the surface, they fill the upper portion of the shell, which serves for a steam drum. As the tubes are attached only at one end, they expand and contract independently of each other, and the joints are not liable to strains, as in the ordinary form; and the lower part of the main shell answers for a "mud drum," into which all the sediment which may form in the horizontal tubes is carried by the circulation. If a tube should burn out, or fail in any way, it is readily unscrewed, and replaced by another; and the whole of the heating surface can be inspected and cleaned in a few moments by means of doors placed in the walls of the heating chamber.

CARVING AND FURNITURE.[1] — IV.



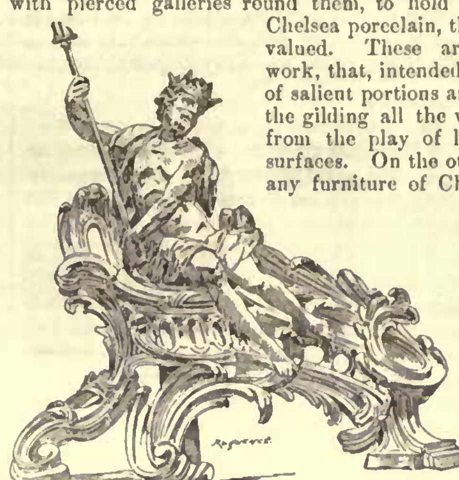
The Heppelwhite Chair Period from 1782. A Sheraton Chair. Period from 1792.

WHEN you set about to furnish any man's house, the first question seems to me to be the owner himself. How is his own mind furnished? Every one who orders a house for himself ought, in my judgment, to know his own mind, and so far as regards the house, his architect ought to know it too. He need not be learned in the matter, but one expects him to have some leanings towards this or that. He should have seen other houses, and some one amongst them should have left some definite impression on his mind. He has to show this to his architect. All he will show will be symptoms, as a patient details his symptoms to a doctor. It is for the architect to explain them, to understand what his client wants. And as the owner of the house can only unfold his mind in generalities, it is for the architect to meet it in particulars. That is part of his profession. To be an architect one has to know, and know thoroughly, all the necessities, all the splendors, all the possible circumstances of ordinary life. I do not think that many architects are trusted to supply these various needs. Furnishing is left to advertising tradesmen. It is but common justice to bear witness how well many of our present firms do this part of their work. But they labor under a great disadvantage. They have to run a race against fashion, and fashion is under no sufficient rule. They try to outdo each other in novelties, it must be so; and their best performances are copies of the work of a century back. In this respect we show well. These copies are often admirable, I mean the solid mahogany chairs and tables, and the veneered furniture of mahogany, in all its varieties of pattern, of satinwood, and other rare material.

As this lecture will be chiefly devoted to furniture proper, I propose to examine the sources from which we derive our modern furniture revivals. Of Jones and Wren we have already spoken. They worked for a learned age. They replaced the burly spirited carved woodwork of the Elizabethan style with a more cold, but a more correct and scientific, following of the Classical. It was a good deal taken from the prevailing fashions of France in Wren's time. The Stuart kings had intimate relations with the French Court, and if you examine the panellings, fire-places, door-ways, and so forth, in the houses built in that country during the seventeenth century, you will recognize the likeness. The French king was fastidious and arbitrary. He set the fashions in his own country, and assumed that other countries would follow the example. To a great extent he succeeded. But the fashions now popular are copied from those of a less severe period. The art of every period reflects the manners and the sentiments of its own day. It is stero, or it is devout and poetic, or, again, luxurious and gay, because the artists are generally men of their time, and because it supplies the wants of its own generation.

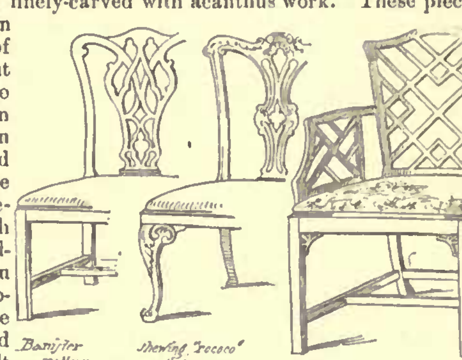
Every one knows how gay the art of the eighteenth century was in France, how changed from that of the seventeenth, how entirely devoid of elevation, of sentiment and aim. But French fashions prevailed over the greater part of Europe. The Italians, with better feeling, purer taste, and an astonishing skill in every kind of art connected with splendid and sumptuous living, were no longer supreme, as they had been. Italian workmen found their way to every country. In France, and in this country, in the brilliant court of Augustus of Saxony, and in Russia, Italian workmen were employed, but in carrying out French, not Italian, fashions. A number of Italian names are found among the decorators of houses and furniture of this country down to the century in which we live.

We had, however, during the last century, in England, architects who both built houses and designed the fittings and furniture they considered proper for them. As their designs are still highly prized, it is worth while to say something about them. Sir William Chambers, the architect of the present Somerset House, of private houses at Roehampton and other places near London, was a travelled man. He had been employed by foreign courts. He had made a voyage to China, and, as you know, had written a treatise on civil architecture and Chinese gardening. He is the first artist who seems to have appreciated the interesting side of Chinese art, known up to that time only as it is seen in porcelain. Chambers found a ready follower in Thomas Chippendale. If we examine the French carving of that day, which goes by the name of *rococo, rocaille, coquaille,* —that is, rock and shell work, which surrounds the large wall-mirrors, the large room-panels and furniture, we shall find that the work of Chippendale for similar uses is both more interesting, and more massive and rich in artistic effect. Chippendale, following the same inspirations, made cabinets, bureaus, tables and shelves of mahogany, with pierced galleries round them, to hold Indian, Dresden and Chelsea porcelain, then and still so highly valued. These are distinct classes of work, that, intended for the gilding, is full of salient portions and reliefs, so as to give the gilding all the value which is derived from the play of light upon its uneven surfaces. On the other hand, the mahogany furniture of Chippendale is as light as it is possible to make it without sacrificing the strength which each piece of furniture requires. It has proved in all cases to have been the very perfection of workmanship. We will examine some of it presently.



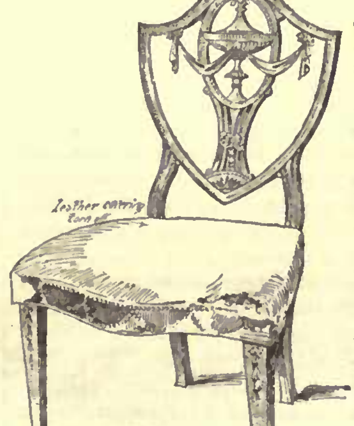
FIRE-DOG · XVIII CENTURY (Rococo)

We occasionally meet with mahogany carved furniture, which is much more massive. I have not been able to procure photographic slides of good examples. There are old pieces in Wilton House, the legs or supports, both of tables and chairs are mahogany, bulging out and finely-carved with acanthus work. These pieces are of older date than the designs of Chambers, but they belong to the time when mahogany was in general use, and are as massive as, but far superior to, the Dutch fashions of William and Mary in grace and decorative effect. The metal mounts and handles, in gilt bronze or brass, are generally of much richness, and all worked over with the tool after casting. I have also met with chairs with solid backs, on which are small panels carved out of the solid wood, containing monograms, sometimes Chinese devices in relief, but sunk below the surface so as in no way to interfere with the comfort of the sitter. The Chinese tastes of Sir William Chambers introduced a kind of wood decoration, scarcely to be called carving, viz., fretwork and trellises. They are cut out with fine saws, or, if on a larger scale, are examples of open-back parqueting. Photographs of towns, houses and gardens in China show us trellises or fretworks of this kind in endless varieties. They are rectangular compositions, and seem to be used as fences or railings, or gallery balustrades. Though the openings are apparently all of one pattern, and are all of similar proportions, they are found often to vary in many subtle ways. Simple as these trellises are, they are of great value in furniture design, and are well worth studying. The ordinary key fret, single or double, belongs also to this class of decoration. It occurs in the finest woodwork of the Renaissance carvers, and in the mouldings and borders of Chambers, and indeed, is met with in antique decoration.



Banister pattern Period from 1754. Showing "rococo" influences. Showing Chinese influence.

Amongst the furniture designs of the time of Chambers, we ought to notice the admirable ceiling decorations, of which such numerous examples are still to be seen in London and in country houses. Some are evidently the work of French or Italian designers. Cipriani, Capitsoldi and Voyers are names of foreign workmen and artists whom Chambers introduced into, or attracted to, this country. Ceilings are to be met with, set out with fine mouldings after the fashion of some of Boulle's cabinet fronts; portions filled with trellis, the moulding decorated with offsets of natural foliage; panels filled by busts in relief; little figures sitting on the mouldings, designed after nature, representing the costumes of various nations,

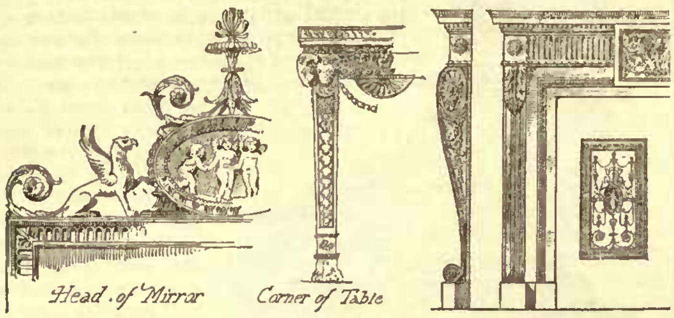


from the Collection of Old Furniture of the late Mr Emerson. G. Shaw. North Beverly: Mass.

[1] A lecture by J. Hungerford Pollen, delivered before the Society of Arts, and printed in the *Journal* of the Society. Continued from Page 223, No. 515,

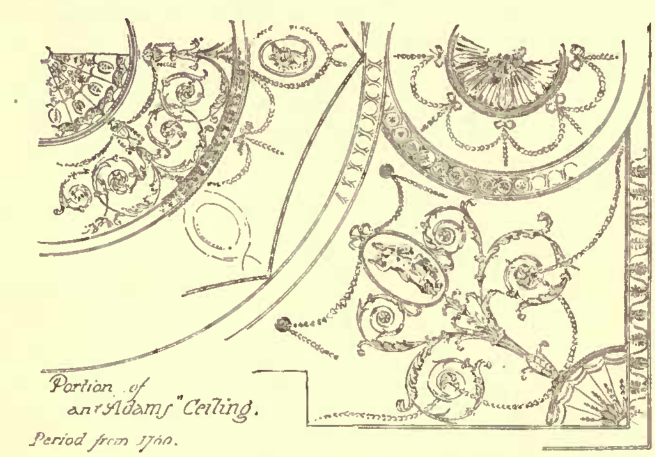
drinking cups of tea, or in fanciful attitudes. Work as excellent as this is rarely met with later than the middle of the century. Very good Italian ceilings are still to be seen in large houses in Dublin, built some thirty years before the Union.

Another name deserves special mention, especially in this place, that of the brothers Adam — the two *Adelphi* — who have left their name to the streets immediately round us. They acquired the ground



Head of Mirror. Corner of Table. Mantelpiece.
Period from 1760.

in 1769. Robert and James were speculators; fortunately they were also accomplished architects. Lansdowne House, Berkeley Square; Derby House, Grosvenor Square; the houses in Portland Place, and numbers of other buildings were built by the Adams. They designed their ceilings, wall-decorations, and the entire furniture of their houses. Their architecture is less bold than that of Chambers and his school. Their decoration is thin, their mouldings small; they lack a good deal of the play and inventiveness of an earlier day. But they followed carefully the decorative work they had studied on the architraves and cornices of the Roman ruins. Their most important drawings have been published, and numbers of original designs are to be seen in Sir John Soane's Museum, Lincoln's Inn Fields. It should be remembered that Herculaneum and Pompeii were then new discoveries, and public interest once more turned eagerly to Classic models. The great men who had, in fact, produced a Classic Renaissance, founded on such remains as were then known, did in fact create, with astounding skill and fecundity, a classical style of their own; but these men had long disappeared. Travelled artists had been to Greece as well as to Rome, and the revival of the days of the Adams was a new one, though of far less promise than that of the sixteenth century. The fine metal-work recovered from Pompeii influenced the Adams, and suggested their thin swags, their wiry metal stars, fans, medallions and other ornamentation. They did their best to introduce the figure into their decoration; medallions containing Hebes, cup-bearers, and other single figures, drawn more

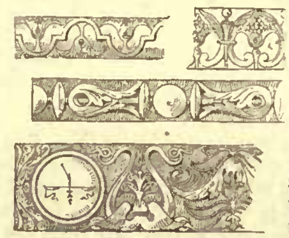


Portion of an "Adams" Ceiling.
Period from 1760.

or less from wall frescoes, figure constantly in Adam decoration. The execution of these portions we owe probably to the Italian modellers then working in London.

French furniture and carving underwent a remarkable change during the same period. Louis XVI gave a name to much furniture of great beauty, and to an excellent style of carving. Old Paris houses, and old country houses in France, contain overdoor and chimney-piece panels, with classic vases, surrounded by foliage and fruit, gracefully composed, and carved with great skill. The style of this insignificance corresponds with that of Grinling Gibbons. There is a little ... time, now in the South Kensington Museum, the panel-operations fo... with low relief, and gilded and painted, which is worth climate, the enlarg...st of the carving I have described, whether in oak far the most favorab... intended to be painted. There is excellent indications knows that ... with on small furniture, boxes, the frames north-west coast of the con...es of the same date. It was the fashion climate of Alaska would be ...tings in oil in panels above doors and of the Rocky Mountains, from ...itation of reliefs of marbles; others ...ouchet, Fragonard, and the school

Carving, however, was on the wane during the years that preceded the French Revolution. Boule work replaced the noble and spirited carvings of Bachelier and a score of sculptors in wood. To Boulle succeeded a number of makers of marquetry, or pictorial veneering in colored woods. But we have now to note an excellent kind of metal-work, which made the chief decoration of the Louis Seize furniture. This metal-work consisted of mounts or decorative edgings, lock-plates, borders, and so on, applied to veneered furniture or to furniture made up with panels of Chinese lac-work, or with panels of Sèvres porcelain, or porcelain cameos made by our own Wedgwood. The artist best known in this kind of metal-work is Gouthière. His mounts sometimes are little Cupids, or grotesque figures, with graceful foliage carefully modelled from nature. The work is cast in bronze, carefully chased, and well and thickly gilt. We shall see photographs of pieces from his hand presently. There were good mount workers in this country during the same period. Capitsoldi, already mentioned, was one of them. There was a taste for lac-work in England during those years. Clock-cases and other furniture are sometimes met with, bearing imitations in lac-work and gold dust of



Period from 1771.

Chinese designs. But the best contemporary lac-work we meet with is imported from China, mounted in gilt metal, sometimes with silver lac. The days of Louis XVI and of George III were prolific in marquetry. A number of makers' names are preserved in Paris. Riesener and David are the two best known. Their work is sold at fabulous prices at the present day. Riesener's is generally laid out on a ground of tulip or purple wood, and in patterns of lime, pear and other light woods delicately varied. Heads are sometimes introduced, and the attributes of geography or music, or some other scientific subject. In those cases a very slight shading is introduced by burning, and the burning is effected by means of hot sand. A slight warm burnt-umber tint is thus added where required, without the violence of color produced by using red-hot iron. The best works of Riesener are veneered with light wood of various tints of leather color. Those of David have woods of several colors, green ebony and stained woods. All this furniture owed much to the elegance of the metal edgings, mounts and handles with which it was finished. In England very beautiful marquetry was made during the reign of the Adams in satin wood, which is of a delicate golden yellow, and with patterns and designs of mahogany and colored woods. Some pieces of this kind — cabinets or sets of shelves in various quaint shapes, and surmounted by a clock or a stand for a piece of china — are occasionally met with. They are lined with tulip wood, or similar material, and are masterpieces of workmanship.



Walnut wood with fine brass mountings. the feet of ebony & brass

Old Bedstead in the Van Rensselaer Mansion. Albany, N.Y. Date of house 1765

It is necessary here to allude to the polishing of furniture of this kind. Varnish with the brush is an odious way of defacing good, and of slurring over bad work. The material is lumpy and uneven, and it attracts false lights, and indeed gives a general impression of unreality to the work it covers. But the polish known as French polish is first met with in furniture, carriage panels, snuff-boxes, and small objects under the name of Vernis Martin — Martin's polish. Robert Martin was a carriage-painter, *vernisseur du roi*, born in 1706, and well known during the first half of that century. He painted heraldry, small subjects of Cupids and shepherdesses—probably employing many miniature painters. We find ivory fans with court balls and other subjects on them, and evidently by many hands. But his *vernis* was a fine lac polish, borrowed, probably, from the lac workers of China or Japan. It was laid on with great care, rubbed down, and laid on again till it reached the fine glossy surface of Japanese lacquer. It was considered a secret in his own day. The chief secret consisted in the careful manipulation, and the amount of what is familiarly called elbow-grease applied to it. After his death this decoration was continued by his sons and others. In this country we see it applied to satin-wood furniture decorated by the paintings of Cipriani, of the beautiful Angelica Kauffmann, and of other artists. This kind of polish is a necessary detail of veneering which must be absolutely secured from damp, so that the glue which holds it to its base may not run the risk of softening or disintegration.

How are we to offer any opinion on the furniture and the general art of woodwork of our own day? Perhaps by what we have seen in great exhibitions. It is thirty-four years since these international shows began. I have had to form a judgment on contemporary furniture as far as it was illustrated in most of them. It cannot be doubtful that between 1851 and 1884, there has been an enormous advance in this kind of sumptuary art. Carved sideboards and other

important pieces of furniture sent to the earlier exhibitions, and objects of great curiosity in their day, would compare very unfavorably with what has been seen on later occasions. There is, in the Kensington collection, a cabinet of carved pear-wood and ebony, with box-wood panels and terminal figures of support, from the Paris Exhibition of 1867, worth careful study. It has been removed from South Kensington to Bethnal Green. It is the work of Henri Fourdinois, and shows the fruits of careful instruction. The prominence of the greater features of support, the flatness of the panel reliefs, the repose of the finer cuttings on the mouldings, show how thoroughly the artist who designed and laid out the general plan has understood his work. The actual sculpture is excellent. But it is on this initial understanding that I want to insist. I remember, also, a small room, fitted round with panels and carvings, I think, by Messrs. Trollope, in Paris, in 1878; some admirable satin-wood veneered work, by Wright and Mansfield, 1867; ebony and ivory marquetry, by Messrs. Jackson and Graham, in 1867. Carvings sent by Vespignani from Rome in 1862; by Frullini, Giusti, and others, from Florence, in 1878, are full of grace, and bear testimony to the subtlety of feeling, and the pliability of hand still proper to the Italian carver. As for Signor Bulletti, for some time head of the School of Wood Carving at Kensington, his work can be seen at Alnwick Castle. It is to be regretted that that building is not close at hand, that we might study it. Mark Rogers is a name too well known to need words of praise from me.

In treating of wood manufactures and furniture, I have dwelt all along on what I think a great need in England—a knowledge of the rules and outlines which govern good composition, and which are indispensable to the due value and effectiveness of ingenuity and skill of hand. Rules will not give us inspiration, nor put grace and beauty into our creations. What they will do is to teach us how to bestow the skill of our carvers (which, observe, I take for granted) to advantage, and how to economize time and labor. To have the leading features of great pieces of carved work—the divisions, prominences, hollows—all in due proportion, and all in their proper places, is the first essential element of good composition. The filling up may be faulty, weak, wanting in knowledge and skill, but a certain grandeur and completeness will never be altogether wanting to a building, a picture, or a cabinet, if these outlines are well laid out at the beginning.

As regards furniture, under which term I include not only chairs, tables, cabinets, drawers, etc., but the entire interior architecture and disposition of halls and rooms: As regards furniture, we labor under the serious disadvantage of having no *style* belonging to our time or our country. Forty years ago, mediæval architecture seemed likely to be revived, both here and in many parts of the Continent. The Houses of Parliament, the chapels and halls of our ancient colleges, were either new structures, or were restored and repaired. Great exertions were made to get casts and fragments of old work, from which carvers and joiners could work. Now, when we have succeeded in training carvers in one style, fashion has set towards another. Much knowledge of drawing is required for the carving of the present day, and constant study of old models. The old examples, indeed, are so very many, that their very number constitutes a serious difficulty.

Before closing these remarks, I must call attention to a kind of art very different from that to which our eyes have been used in the western world; I mean the wood-carving of the East. I have had opportunities of studying Oriental art, as we find it in the appliances of daily life, both in Syria, Egypt — that is, the art of various Arab races—and in India. You see Oriental art—for I class these phases of it under one head—you see that art in its most sumptuous form in India; in its greatest refinement, I believe, in Persia. But Persian art I know only from fragments in museums. I presume that the Indian Mahometans, the Syrians, Arabians and Turks, have derived their sumptuary arts from Persia; the Hindoos have derived theirs from northern Asia. As to Arab and Syrian art, there are examples of doors, door-panelling, decorative-panelling, from mosques in Cairo, window screens, and an entire room, which can be studied in the Kensington Museum. There is a family likeness in the general arrangement of rooms in most of these countries; and the window-screens, composed of trellises of turned wood, belong to a state of society in which the ladies of the family are kept in strict seclusion. In India you see these screens made of pierced slabs of marble in a variety of patterns — quatrefoils, circles, squares, and so on. They keep out the sun and admit the air, and the openings that are covered with these screens have the character of wall panels, richly wrought, full of repose, yet never dull in character. The light and shade which these admit inside the walls are as varied and agreeable as the chequered and subdued sunlight that reaches us through trees and flowers in the open air.

How far Oriental furniture carving and woodwork are admissible into modern houses is an interesting question; chiefly, as it seems to me, in such places as require screens or ventilators, and in the sides and backs of divans, benches, garden seats, and the like. As for the small Japanese window-blinds sold in London, they are miracles of good workmanship, and perfectly calculated for the places they occupy. In India, broad verandahs or galleries round one side of the house are necessities. We see them frequently in Italy, as *e. g.*, the famous *loggie* or open galleries round one side of the Vatican Palace, and the Farnesina. In our climate the sun is rarely oppressive, and screens to exclude the sun and admit the air are not so much in request. Still, screens are required in many places; and turned or pierced work, easily executed, though it has not much design, is susceptible of endless varieties of pattern.

Amidst materials so numerous of such different kinds, what shall the student, the carver, the joiner, or the architect do? Since we are surrounded by splendid relics of the past, and are not inventors, nor bound by recognized rules, we must try to get the past mapped out in our minds. The great variety of chests, cabinets, panels, and so on, that we meet with in museums, are all found, when studied, to have been made under definite traditions. Moreover, various as the work of different dates, and the inventions of different minds appear at first sight to be, this work has more in common than it has of what is distinctive, though it is also true that every inventive mind has its own character, and no two such minds are absolutely alike. But it is the general obedience to laws which they all held in common, and all take for granted, which leaves them otherwise free to use their imagination within these acknowledged limits with an inexhaustible fertility of invention. As for composing and carving, let no one suppose that he will ever master universal knowledge or skill. A designer, a carver, a workman will develop some one talent. He may have a natural aptitude for proportion, or for designing and carving graceful foliage, while the figure is up-hill work to him. Another will do that admirably, while his acanthus leaves will be arranged merely according to book, without grace or feeling. Each must do his best with such gifts of hand and eye as he has. But though it is good to study all sorts of art, Italian, French, English, the Mediæval, Renaissance, Elizabethan and Oriental, as well as Western, and on the whole to master the ideas that underlie these varieties of art; though it is good to study this wide field, such an extensive study can only be for those that can find time for it. All such study is a gain, but to practice all these various kinds of carving is an impossibility. It is for the working artist to master the rules, the ideas, and the good examples of that branch of the sumptuary arts to which his mind and his hand turn naturally. It is *good* not to be ignorant of the ground that lies outside and beyond the field of your chosen labors, but it is *necessary* to know and be familiar with all that lies within it. To be *great* one must be *thorough*, and to master one kind of artistic excellence, you must narrow your field of study. There is no kind of genius that is universal.

The retrospect one takes of the art of wood sculpture, and of that of furnishing rooms and houses, seems to show that sculpture — that is wood-carving decoration in actual tangible relief—has in all times been considered the best kind of decoration. The best artists of the best times have decorated walls and houses with tangible and durable ornamentation. There is a feeling of completeness, of habitableness, even a sort of companionship in what is produced not by the illusion of painting, or by mere splendor of precious material, but by the constant play of light over actual relief on the work of the sculptor. In proportion as his dramatic power has dwindled, veneerings and surface colors have, in most countries, taken the place of solid reliefs. As to the skill, beauty and refinement of such furniture as that of Boulle, Riesener, Gouthière, and other marquetry makers, I have already said how highly I appreciate them. But these artists were giants in their way, and their work, though durable when well cared for, is much more liable to ruin than carved decoration; nor do the broken pieces and fragments of it give us the satisfaction we reap from panels, brackets, chest-fronts, and other relics of times of good carving.

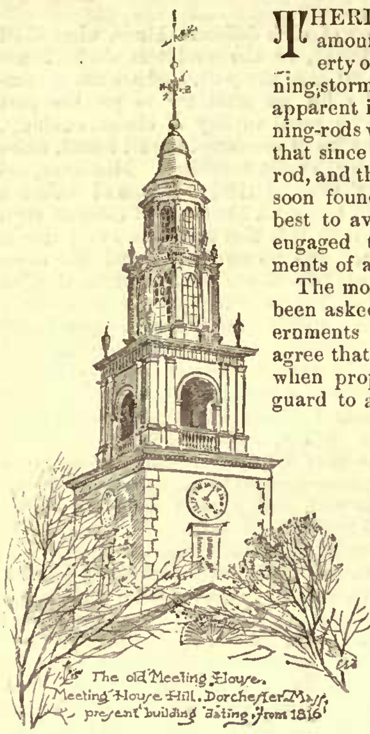
I have expressed my regret that carving in such large and costly buildings as war-offices, foreign-offices, admiralties, and other national monuments of the architecture of our day, should not commemorate our skill as carvers in wood. If we economized some of the thirty or forty coats of oil paint which the walls of our public offices will receive during their first five-and-twenty years, and invested the money in carved mouldings, door-heads, chimney-pieces and panelling, would the treasury be a loser?

I do entertain some hopes of the architects of what is called the Queen Anne style. I hope they will get ashamed of putty squeezes and fanciful joinery, of which one sees a great deal too much, and take to honest carving, however small the quantity, instead.

I have insisted on mouldings—carved mouldings—not to the exclusion of carved panels, door pediments and porches, because many kinds of designs can be applied to them, and because lines — straight lines—have a sort of initial or fundamental value in decoration. The front of a house, the side of a room, are marked out by straight lines into their necessary proportions. These lines may be mouldings, string-courses, or great masses like pilasters or columns. Doors, windows and other openings we draw with straight lines. If we wish to enrich even a drawing, the artist draws one or two lines round the openings, to soften their edges. In actual doors and windows, fireplaces and the like, mouldings of various sizes and sectional shape, are the lines by which we surround and soften off the edges of openings which would be bald, harsh, and dull if left bare. Such borders are real enrichments of the most legitimate kind, being tangible features of our architecture. Mouldings, moreover, are simple in the carvings they require; they may be decorated by hands that are but moderately skilled, and no other carving produces so broad and general effect in proportion to the labor and cost expended on its execution.

TALL CHIMNEY CONSTRUCTION.[1] — VII.

THE USE OF LIGHTNING-CONDUCTORS AND HOW TO USE THEM.



THERE is no doubt that a great amount of danger to life and property of all kinds is attendant on lightning storms. This was particularly made apparent in previous years, before lightning-rods were applied and from the fact that since the discovery of the lightning-rod, and the beneficial results which were soon found to follow, the matter of how best to avert this source of danger has engaged the attention of the Governments of all civilized States.

The most eminent scientific men have been asked to instruct the several Governments on this subject, and they all agree that the lightning-rod of Franklin, when properly applied, is a perfect safeguard to all kinds of structures against the destructive effects of lightning-storms. The instructions issued by the Inspector-General of Fortifications (Great Britain), and which have been adopted by the American and other Governments, are the most lucid and comprehensive, and these we found upon in the instructions which follow.

The following are a summary of the rules which should be observed in applying a conductor: —

1st.—That it should be continuous in all its parts.

2d. — That it should be placed in close contact with the building, or other object to be protected, and should on no account be insulated by glass or earthenware.

3d. — That it should be led several feet above the highest point of the building.

4th.—That all piping and metal on roofs should be connected with it, and in a case where more than one conductor is required, they should be all connected together, either above or below the surface, the piping and other masses of metal in the line of probable discharge being also connected.

5th.—That it be properly connected with the earth, terminating in a large metal surface and be sufficiently deep into it, according to the degree of moisture in the soil, so as to secure the complete dispersion of the lightning.

For ordinary small buildings one conductor will generally be sufficient, say of not less than one-half inch diameter copper rope. It should be erected at the end, the point rising at least two feet above the chimney. A horizontal conductor should also be added along the ridge. It should be fixed close to the buildings, and should have no joints, if possible, in the whole of its course. Special attention must be given to the chimneys in all buildings, because they are virtually tubes lined with a carbonized conducting material, the more so if there are fires below sending up a conducting column of warm air. The warm air really invites a discharge from the cloud; hence it is that when lightning enters a house it is generally by the chimney.

For larger buildings a rod should be placed at each end, at intervals of from twelve to fifteen yards along its length, the roof and chimneys being protected as before. It is important to join any metal on the roof with the conductor, or in the case of tiles, by running a length of rope along. Instances come to our knowledge where the building is struck at some distance from the conductor. Recently the gable of a church was struck, although a conductor was on the spire. A building forty feet long should have two conductors, as a rule; and if one hundred feet or more, three conductors. Larger and more complicated buildings should be protected on similar principles, having rods at each corner and rope along the ridge, all being properly connected with the earth. Separate "earths" should be provided for each, if necessary.

The War-Office Instructions have the following with reference to powder-magazines: "When large quantities of explosives are stored in underground magazines, such as the main magazine of a fort, they should be fitted with lightning-conductors on the same principles as ordinary magazines above ground. The same rule holds good as regards underground magazines situated on prominent points, the top of a hill for example, under which circumstances like precautions should be taken — magazines of small extent underground need not, as a rule, be provided with lightning-conductors. Casemated batteries of modern construction, in which the magazines are distributed throughout the basement story, must be provided with lightning-conductors. The arrangement will vary with the plan and extent of the work, but it will generally be convenient to have one or two horizontal conductors on the parapet or terreplein, extending from end to end of the battery, attached to vertical conductors connected with the earth. The flag-staff should have a conductor. An iron building is, of itself, a good conductor, but where it is covered with non-conducting substances, such as asphalt and concrete, it is necessary to provide rods or points projecting above the asphalt, and to have a proper connection with each."

Water-mains provide the best earth-connection, if conductors are properly secured to them. In the absence of these, and where there is no drain or well of water near, or where the soil is clay or rocky, the conductors should be surrounded with a quantity of coke to increase the contact, and salt should be applied so as to increase the moisture.

When the conductor is in more than one length of rod or cable, the joint, if with rod, should be soldered, and if cable, spliced carefully.

In applying lightning-conductors to churches, towers, monuments, columns and general ornamental buildings and chimney-shafts and portions of public works, to powder-magazines, etc., the same rules are to be observed. The varying circumstances of each case require to be studied—the extent—the several prominent parts above the roof, preserving the outward appearance of the structure, etc. Generally a more capacious conductor is fixed—the metal work requires to be more carefully joined, and in order to protect the outward amenity of the structure, the conductor may require to be carried down through the centre, as in the case of the Albert Memorial, in Hyde Park. In all similar cases the lightning-conductor should form part of the original plan of the structure.

The following, with regard to earth-connections, require to be observed. The lower terminal of the conductor should end in a copper plate, the large surface of which being necessary to facilitate the thorough and more ready diffusion of the electricity. It should be led into damp ground—the presence of moisture being a favorable condition—or into a well, water-course or body of water, when practicable. Shingle, sand or other light dry soil, or even vegetable soil when dry, not being good earth-connection, the rod should be led through these, and continue till water or a permanently damp soil is reached. The conductor should be led into moist ground by means of a trough extending to at least eighteen inches below the surface, and in which is a considerable length of metal — the War Office recommends as much as thirty feet of metal—or a plate four feet square should be in actual contact with the moist earth — and in the case of very dry sandy soil, the trench should be arranged to suit the circumstances, and may extend from the foot of the conductor to distances of from ten to forty yards, according to the amount of moisture — and when practicable a flow of water should be led from the down pipes of the roof of the building over the ground in the vicinity of the earth-connection, or into the trough just referred to.

With reference to the extent of metal required to be in actual contact with the earth—it must be borne in mind, that although the earth, like the air, is a great reservoir of electricity—it is not so good a conductor of such as the metal which leads it from the cloud — and it is often found that when the electricity comes in contact with the earth, it meets with comparatively greater resistance, and unless the conditions are favorable, is with difficulty, dispersed.

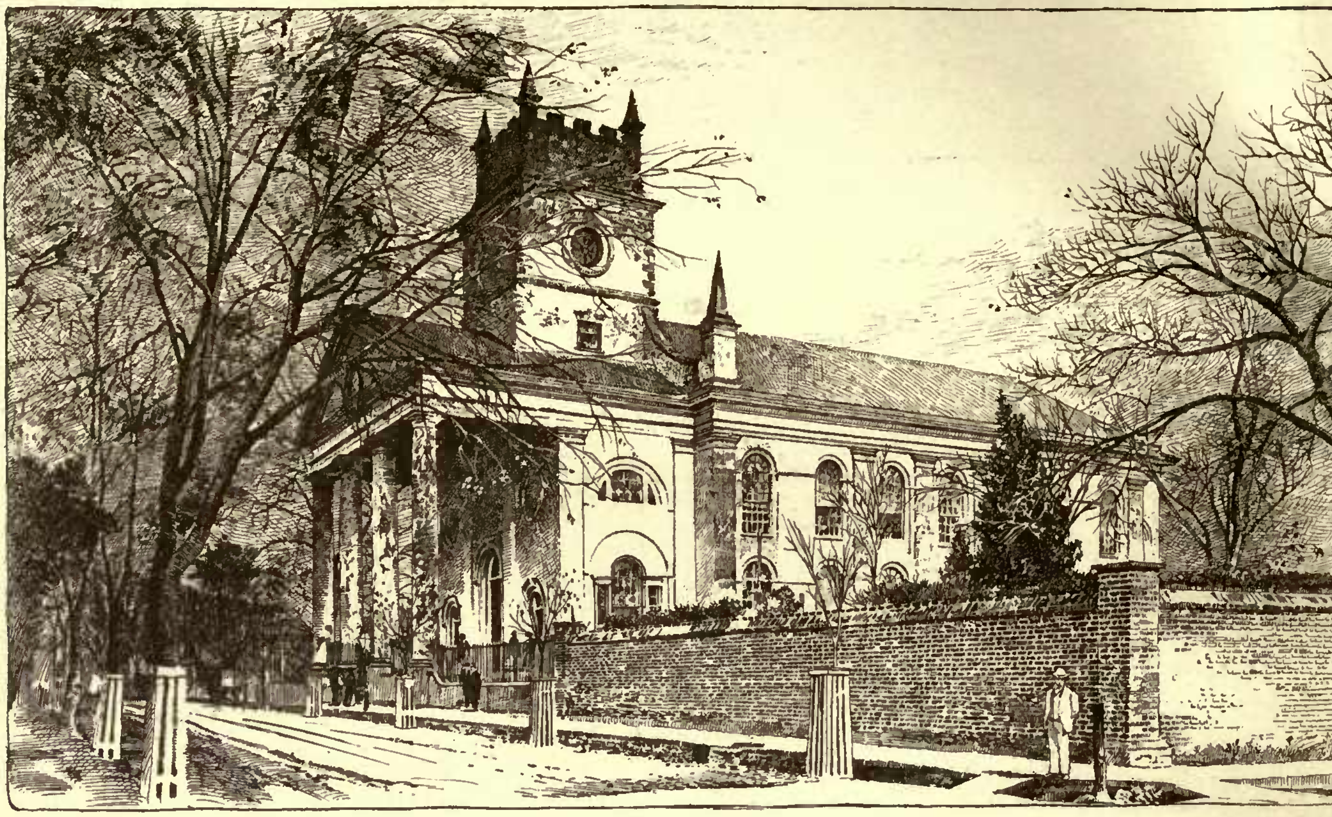
[1] A paper by R. M. Bancroft and F. J. Bancroft, read before the Civil and Mechanical Engineers' Society. Continued from page 225, No. 515.

THE ILLUSTRATIONS.

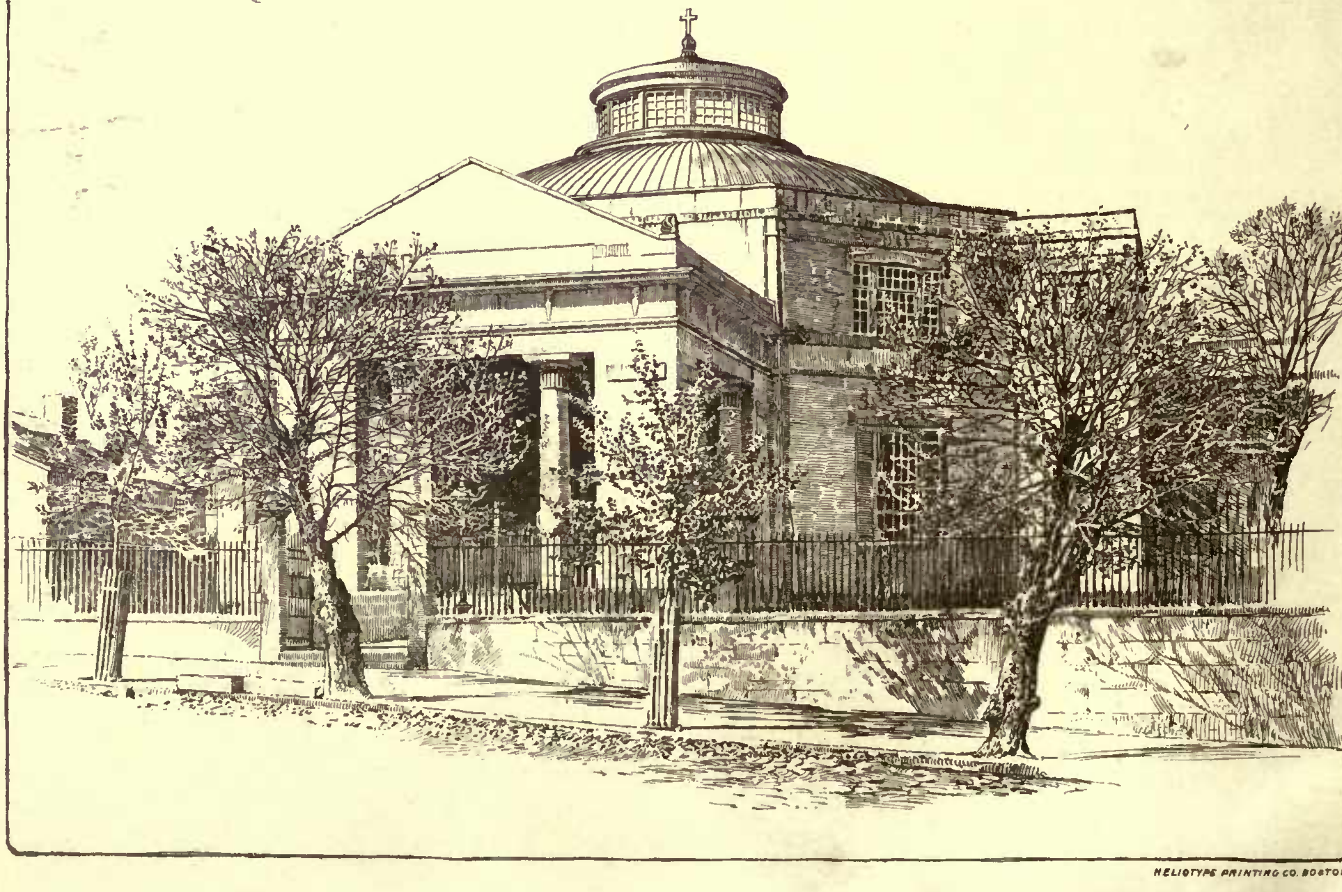
[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

MEMORIAL ROOD-SCREEN, CHURCH OF THE REDEEMER, BRYN MAWR, PA. MR. C. M. BURNS, JR., ARCHITECT, PHILADELPHIA, PA.

THIS screen, erected to the memory of Charles Wheeler, of Philadelphia, was constructed in the shop of Louis Koenig, in the short space of three months. It is built upon a base of Indiana oölite, pierced at regular intervals midway in its height to admit of the insertion of roundels of Mexican onyx, which, with those in the gates — when they are closed — carry the continuity all the way across. The upper portion of this stone base is cabled and carved with deeply-cut mouldings; the top of it, between the bases upon which the columns rest, and on either side of the ridge-roll, is a triple ivy-leaf cresting. From this base ten columns arise, six large and four small, the bases, bandings, collars, and abaci of which are moulded in brass. The lower portion of the columns is of hammered iron, having spiral bandings of brass, between which are brazen bosses and running vine-work of hammered and chased copper. Separating this from the upper part of the columns, which are of copper, the four smaller ones being spirally twisted, are bands, which show large ball-like bosses, set in cups, and banded with chain and twisted mouldings. The capitals of the columns are very elaborately wrought in conventional leaf-work of twisted and hammered brass. Crowning the abaci of the capitals is an octagonal coronet of brass, from which arise the arch-like bands with their cabled mouldings. These are studded with many flowers, each of which is pierced in the centre and has inserted therein a rock-crystal, an oynx, an agate, or a heliotrope. These stones show equally well on both sides of the screen, and, as many of them are translucent, they produce, in connection with the east window, a play and sparkle of color which cannot be fully expressed by mere words. Above the arches run two heavy horizontal beams of wrought-iron, on which are to be seen the bolts and rivets of the construction as forming a portion of the ornamentation. Between these beams are elaborately-wrought quatrefoils of hammered iron, set with



St. Paul's Church (Epis.) Ratcliffeboro'. Charleston, S.C.: built 1819.

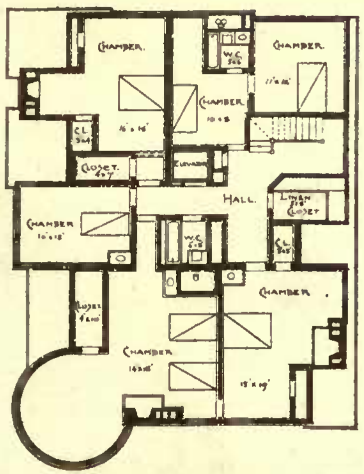


Monumental. Church. built 1811.
Richmond : Va:

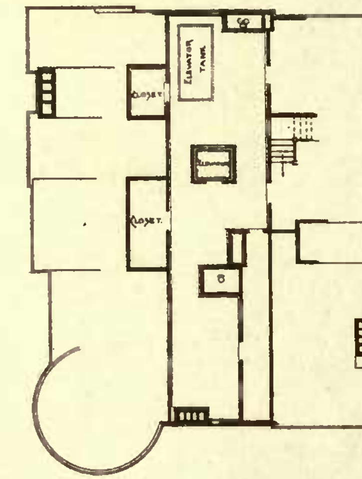
HOUSES ON THE AVENUE ST. NICHOLAS

CORNER OF 146TH ST. NEW YORK

T. M. CLARK, ARCHITECT.

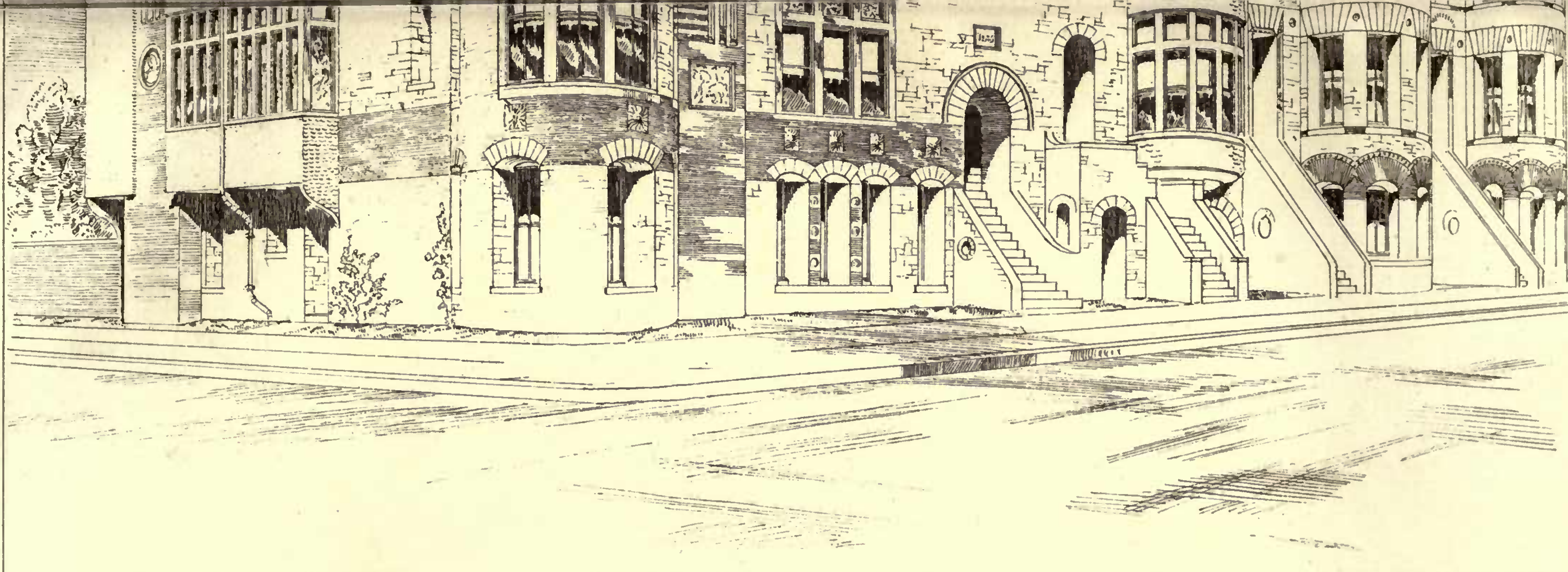


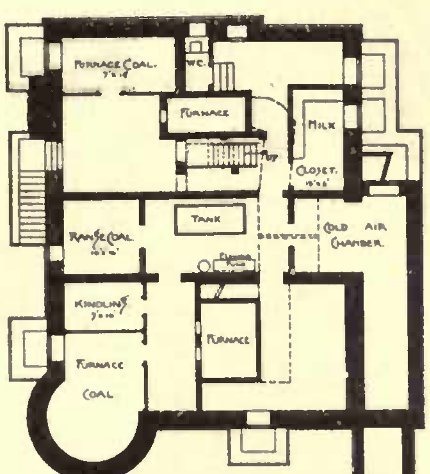
Third Story Plan.



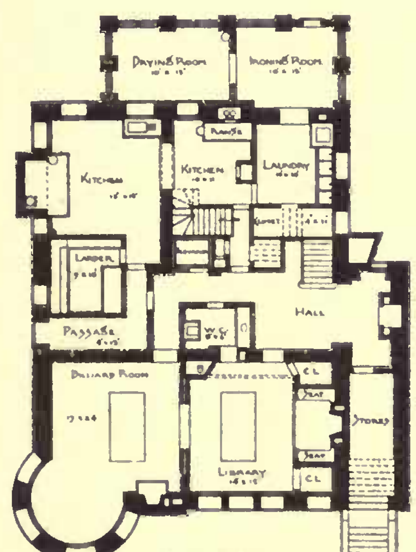
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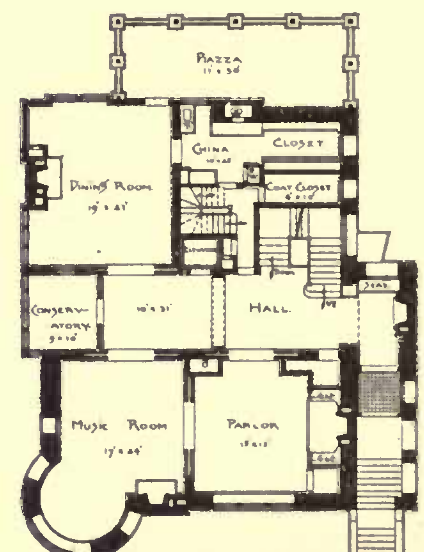




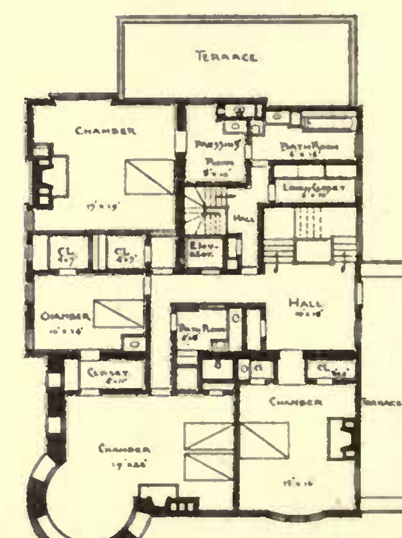
Cellar Plan



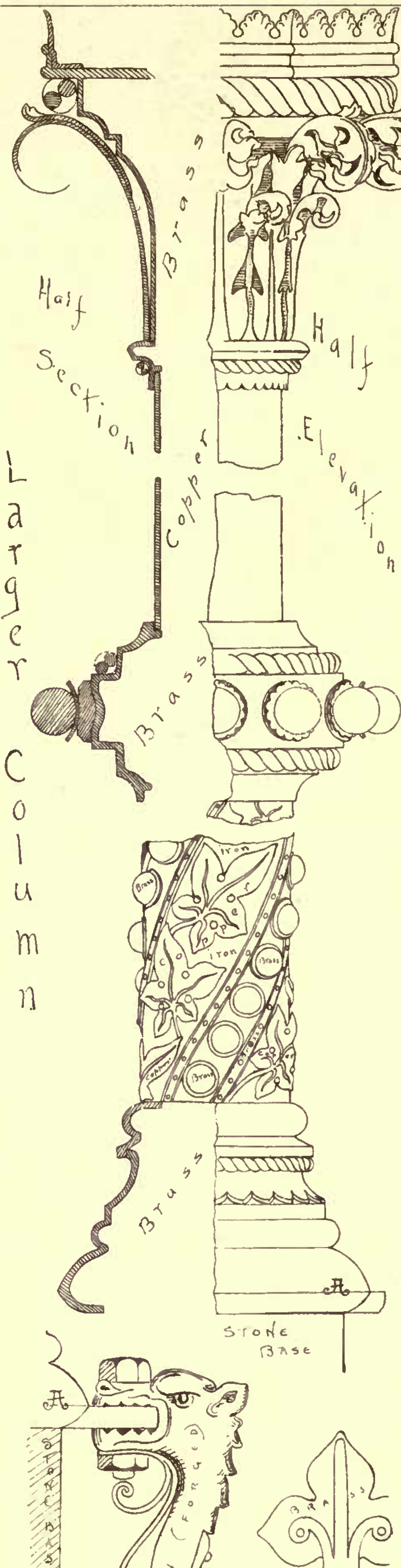
Basement Plan

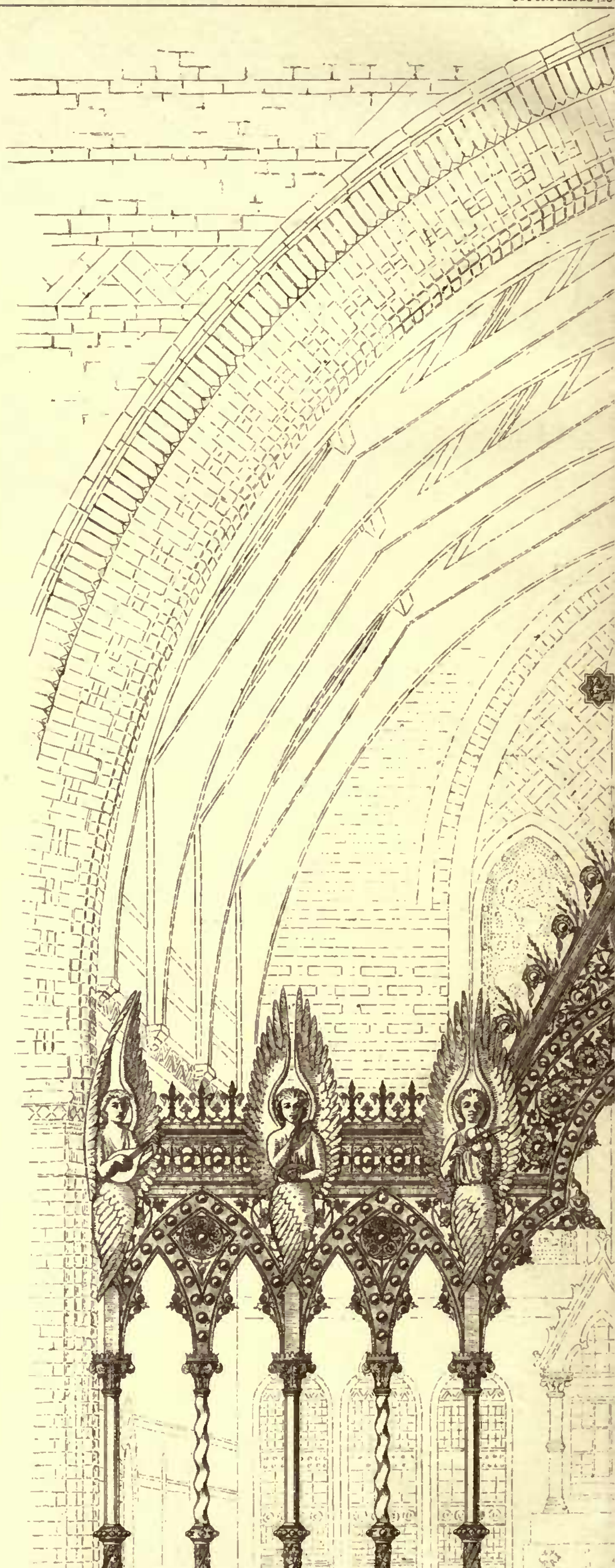


First Story Plan

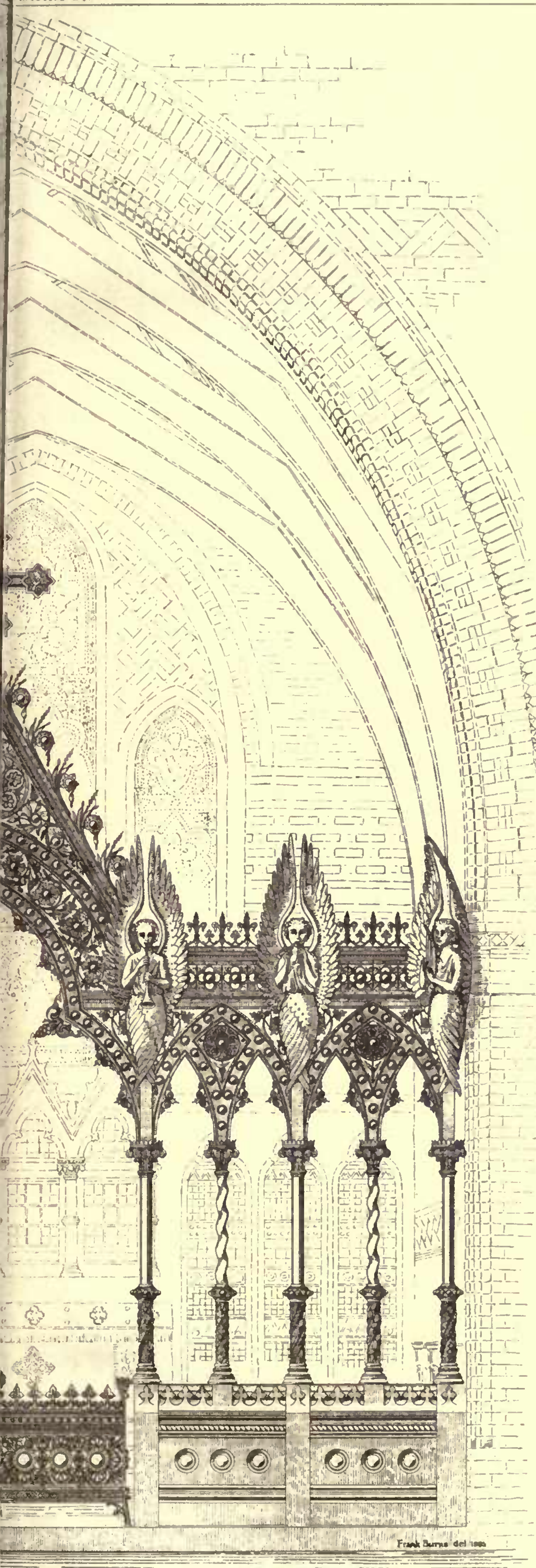


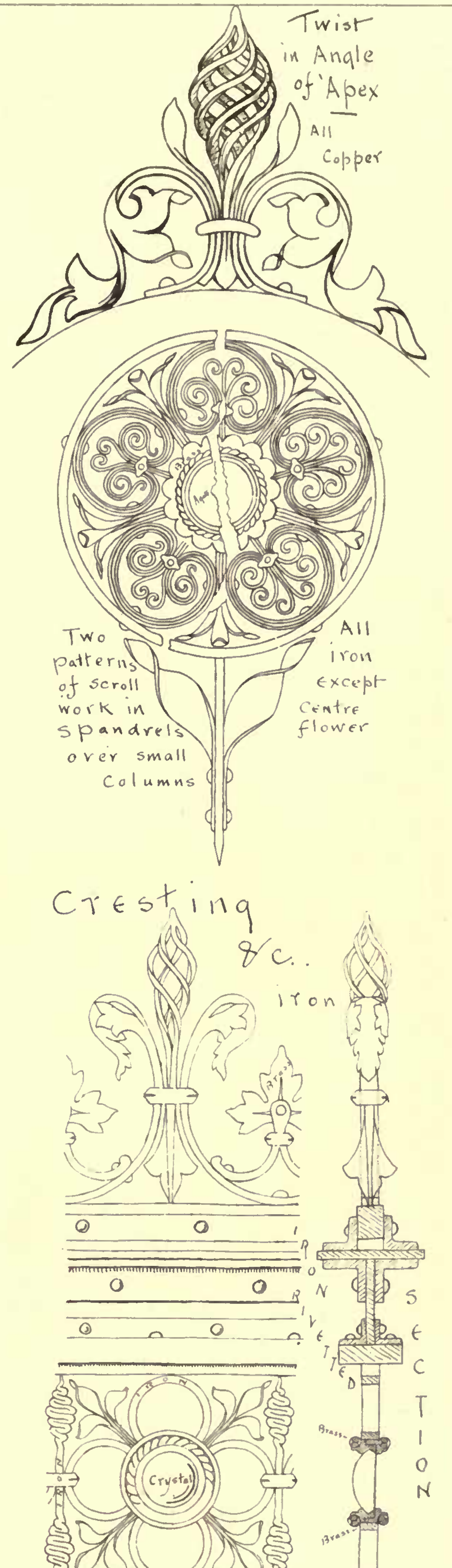
Second Story Plan


Half Section
Brass
Copper
Brass
Larger Column
Half Elevation
Brass
Iron
Copper
Brass
Stone Base
Stone Base
Iron (Forged)
Brass
Iron
Brass
Copper
Hinge of Gate
Brass
Copper
Iron
Brass


Charles M. Burns, Arch't.
FEET.

R. OSGOOD & CO





Memorial Rood Screen; Church of the Redeemer: Bryn Mawr, Pa.

HELIOTYPE PRINTING CO. BOSTON


Residence and Drug Store
for I.H. Mack Esq.
Cor. Lincoln and Gilbert Aves.
Cincinnati, O.
Oliver C. Smith
Walter R. Forbush
Architects
"The Allen Building"
Cincinnati, O.

semi-precious stones. Crowning this is a cresting of recurved and spirally-twisted *fleurs de lis* of hammered iron, between which are triple ivy leaves of beaten brass. Over the gates, in which the same principles are carried out as in the rest of the screen, is the main arch with its surmounting gable. This is not, as in a noted English screen, apparently attached to the main work, but forms an integral part of it. The arch-like bands, as in the smaller arches, have their cabled mouldings, and are studded with flowers having similar centres. Between these brazen bands, for there are two of them, there is an elaborate work of hammered and twisted iron, forming a wreath of passion-flowers having rock-crystal centres. Carried up as a support for the rood is the upper of the horizontal bars, between which and the band of the arch, is a cinquefoil of delicately-wrought iron, in the centre of which is a white stone of conspicuous beauty, in allusion to Revelation ii. 17: "To him that overcometh will I give to eat of the hidden manna, and will give him a white stone, and in the stone a new name written, which no man knoweth saving he that receiveth it." The spandrels are filled with copper, spirally twisted and wrought into flower and leaf work of equally fine execution. The crockets of this gable are roses with leaves and tendrils of spiral and twisted iron, the centres of the flowers are onyx. Surmounting the larger columns and bracing the beams are six seraphim, each one playing upon a different instrument. The heads and upper portions of the figures are finely modelled. The wings covering the lower portion, and those joining over the heads, forming lesser gables, are beautifully wrought in hammered sheet-copper, similar to those attached to the figures of the Scaliger monuments in Verona. Crowning the whole is the rood, or cross, which is of brass in its centre, and at the extremity of its arms are four medallions in repoussé copper. The central one is the Pelican in her piety, those on the arms are two-third figures of the Evangelists with their emblems. The screen is twenty feet wide and twenty-two feet high.

HOUSES ON ST. NICHOLAS AVENUE, NEW YORK, N. Y. MR. T. M. CLARK, ARCHITECT, BOSTON, MASS.

THESE houses are remarkable for the thoroughness with which they are ventilated. Each house has a large brick shaft, through which runs a fire-clay pipe, serving as a flue to the kitchen range. The shaft increases in size in each story in proportion to the additional volume of air to be conveyed away from that story, in accordance with the system introduced by Mr. Henry A. Gouge of New York. All bath-rooms communicate directly with the shaft, so that a constant current of air is made to pass through the bath-room into the shaft. The corner house, of which floor plans are given, is larger and more complex than the others, and has two exhaust-shafts, one heated by the smoke-pipe of the range, and the other by the smoke-pipe of one of the furnaces. A stove used for heating water, entering the same pipe, takes the place of the furnace as an aid to the ventilation in summer. The shafts in this house are very large, the combined sectional area of the two being over twenty feet at the roof. To secure the full benefit of this large exhaust capacity in mild weather, cold-air registers, connected directly with the fresh-air supply for the furnaces, are placed in the halls in such a position that the current from them will mix with the warm current from an adjoining register. In the coldest weather, when the whole of the fresh-air supply to the rooms must pass through the furnaces, the ventilating registers will be partially closed so as not to carry off the warm air too rapidly. In each shaft is a copper pipe, so shaped as to give as large a surface of contact with the flue-pipe as possible, which runs to the roof, enlarging in each story. This pipe is the "sweet-air vent" for the plumbing work, every portion of which is ventilated downwards, through the strainer or other opening by means of a pipe carried to this sweet-air vent, in which a strong current is maintained by the heat communicated from the flue. A large room in the cellar is converted into a fresh-air chamber, the out-door air being introduced through thin cloth, to exclude the dust, and from this chamber air is carried under the cellar floor to both the furnaces, as well as directly to the parlor, library, and halls in the two first stories, all of which have cold fresh-air registers near the warm-air registers. Special ventilation is also provided for the kitchen, by means of a ten-inch round flue, opening under the hood of the range, which carries off the fumes of the cooking.

MONUMENTAL CHURCH, RICHMOND, VA.

THIS church was erected on the site of the Richmond Theatre, and commemorates the first of those ghastly catastrophes in this country which have befallen the unsuspecting pleasure seeker. The Richmond Theatre was burned in 1811, at the cost of sixty lives. The ashes of the unfortunate victims were collected and placed in an urn, which stands in front of the portico.

HOUSE AND DRUG STORE OF MR. I. H. MACK, CINCINNATI, O. MESSRS. SMITH & FORBUSH, ARCHITECTS, CINCINNATI, O.

THE kitchen and laundry are in the basement. The first floor is devoted to the store and dining-room. The second floor contains the parlor, library, and three chambers with bath. One room only is finished in the attic. The building is built of oölitic limestone, from the Bedford Indiana quarries, to the second-story window-sills, all stone trimmings are of the same stone. From the sill up is built of stock brick laid in red mortar. The finishing woodwork is of white-pine throughout. The floor of the store is of tile of Italian marble and red slate.

ST. PAUL'S CHURCH, HATCLIFFEBORO, S. C.

As early as 1810, a congregation of Episcopalians, with the Rev. William Percy as their pastor, performed divine worship in the French church, at the corner of Queen and Church Streets. By 1817 they had built St. Paul's church, and Dr. Percy was regularly installed as pastor. This is by far the largest Episcopal church in the city. It has no pretension to ornament, but the interior is so large, and so well suited to the solemn purpose for which it was built, that it makes pleasing impression upon those who enter. Dr. Percy, the first rector, was an Englishman, and retained, largely, English habits and customs. He always officiated in a full-bottomed wig, like the dignitaries of the English church.

REPORTS ADOPTED BY THE WESTERN ASSOCIATION OF ARCHITECTS.

DURING the Second Annual Convention of the Western Association of Architects at St. Louis November 18 and 19, the following reports on the competition evil and on the establishment by the State of a standard of Architectural attainment were discussed and adopted:

COMPETITIONS.

Your committee on competition has the honor to report, viz.: That in the prosecution of its labors it has diligently examined everything accessible which has been published on the subject for nearly twenty years. It has had frequent meetings and many consultations with architects and others, and has exhausted all means within its reach to make this report thorough, comprehensive and exact.

Though at first it was thought best to introduce a detailed review of the work into the report, upon mature consideration it was deemed unnecessary, because such a course would dilute without adding clearness, and because we found no points not already familiar to every one of you.

Your committee is profoundly convinced that in itself and its far-reaching consequences, the subject of architectural competitions is to-day the most serious question which confronts the profession, and that its diligent consideration should take precedence of everything else at our conventions, until a fairly satisfactory solution be reached. While the practice remains uncontrolled, your committee believes that little material progress can be made in the charter objects of this association, viz.:—

"To unite in fellowship the architects of the United States, to combine their efforts to produce artistic, scientific and practical efficiency in the profession, and to cultivate the study of kindred arts."

Were it not for competitions as they have been conducted, there is no reason to doubt that architects would be easily united in mutual efforts for advancement of themselves and the public.

Your committee would say, if it could, that competition can be abolished, but the facts are against such a conclusion, and before looking far into the subject, this thing became most evident, that in spite of the advice, entreaty and reiterated warnings of all prominent officials of the architectural associations, which are too numerous and lengthy to lay before you and which are simply repetitions of the same sad theme, in spite of confessions of architects generally, that competition so-called is full of evil, still it flourishes and your committee is convinced that it cannot be abolished.

It is a practice which has for ages been more or less in vogue, and has of late been a steadily-spreading custom, so that now scarcely a notable building comes into professional hands, the architects of which are not chosen in this way.

While we are all agreed that this custom is fraught with many evils and is pregnant with danger, both to the architects and their clients, still some of these evils are inherent in the very nature of competition, while many more are not and may disappear in proportion as the method of conducting them is more closely determined by considerations of common-sense and fair play.

But with all these evils, both inherent and unnecessary, competition is a fixed fact of our unwritten polity, and we may as well recognize it *frankly* and *at once*.

This premise has the deepest significance for our fortunes and fame, because it means that the largest and costliest buildings, especially those of a public character, which are ornamental in a greater degree than others, are most sure to be thus portioned out among the architects.

There is no one of us who does not hope as much for honorable fame in his profession as for the emolument arising from its practice, and in these large buildings lie the opportunities. Since, therefore, we cannot stop competitions, how are we to curb them to ensure a fair, open and even field for talent and character in these, the greatest chances of our lives?

If we are ambitious for ourselves and the times we live in, we can no longer, as honorable men, supinely give up and weakly abstain, thus relegating the greatest works to the foul hands of that professional harpy, the competition architect.

It is plain that in taking up this matter this association must drop the passive attitude and must go into action, and as we cannot prevent competition, we must determine here and now to rule it, with the one view of ensuring to ourselves honesty of purpose, intelligence

of criticism, and fair decision, promptly rendered by those having them in charge.

Though your committee knows that it would be worse than tedious to detail here all it has collected on competitions, it does feel that for the sake of getting the subject well before you, every complaint we have found should be briefly stated, in order that you may judge whether the suggested cure covers all the cases. After sifting out all repetition, the following points remain: —

1. *I was beaten by showy drawings.*
2. *A mean design was chosen through intrigue.*
3. *A poor design was selected through favoritism.*
4. *My design was premiated, but the committee would not pay me the regular commission.*
5. *The jury, though honest, was incapable.*
6. *The jury, though intelligent, was not honest.*
7. *The jury did not call for drawings in good faith.*
8. *My competitors showed bad faith.*
9. *The committee requested competition only to obtain a design for a favorite to carry out.*
10. *The committee required guaranties that were unreasonable, after my design was premiated.*
11. *The committee refused to employ me after premiating my design.*
12. *The committee "cribbed" from my design, though it was rejected in the competition.*
13. *The committee accepted a design from a competitor whose drawings were not made as required.*
14. *The committee accepted a design that could not be executed for the sum named in its prospectus.*
15. *My competitors violated the code.*
    - a. *By sending more drawings.*
    - b. *By drawing to a different scale.*
    - c. *By using different colors on drawings.*
    - d. *By filling the description with sketches.*
    - e. *By having a number of drawings in another room for the committee to look at.*
    - f. *By not delivering the drawings in time.*
    - g. *By not sending in their drawings until after ours were in, and had been seen by our competitors.*
    - h. *By personally lobbying with the committee.*
    - i. *By running down their competitors.*
    - j. *By putting in alternative drawings.*
    - k. *By sending in a second set of drawings after he had seen mine.*
    - l. *By under-bidding on commissions.*
    - m. *By being both on the committee and among the competitors.*
16. *The committee did not give every one the same explanations and data.*
17. *The committee said one thing in private, and another in the printed agreement with the competitors.*
18. *The competition was too large, and not enough chance for a busy man.*
19. *The committee would not pay any competitors except the premiated architect.*
20. *Why did not the committee invite a few and pay them, and let the rest go in at their own expense, if anxious to compete any way?*
21. *The committee would not employ competent experts.*
22. *The committee would not give time enough to prepare adequate drawings.*
23. *The committee allowed too much time, thus putting the premium on very elaborate drawings, and necessarily increasing the cost to the competitors.*
24. *The committee desired too many and unnecessary drawings.*
25. *A competitor won by his gorgeous frames and drawings, and the bindings of his written descriptions.*
26. *The committee would not let me see my competitors' designs, in order to judge whether they were in accordance with the requirements or not.*
27. *The committee would not throw off the extra drawings that were not according to the requirements.*
28. *The committee would not decide at the time agreed.*
29. *The committee threw out all designs in the competition, saying that none of them were elected, and then refuse to award the prize.*
30. *The committee chose an architect totally incompetent to carry out his design.*
31. *The committee let one of the competitors act as adviser.*
32. *The committee did not send back my design.*
33. *I would not go into competition unless the clerk had the power to examine the drawings, and throw out everything not in accordance with the requirements, and unless the committee would agree not to look at any others, until after the decision was made.*
34. *After being elected architect, I found that the committee had not the power to act.*
35. *The committee elected me, but afterwards threw out my design because it was judged it would exceed in cost the sums named by them.*

I did not object to this, but I did to their doing it without giving me a chance to go into the matter with them, and show whether they or I were right as to the total figures.

In other words, gentlemen, we have, as a class, been very successful in diagnosis of the diseases which attack competition, and make it unhealthy, but your committee has been able to find only two classes of suggested cure proposed in any of the journals examined.

The first class summarizes thus: that competitions are bad at any rate, and therefore every architect ought to avoid them, and this has been repeated *ad-nausœum.*

The other class calls for us to obtain an agreement from all reputable architects not to compete except under a recognized code.

The last method is the one now being put into operation by the leading architects of England, but time enough has not elapsed to afford any evidence of its value. Nor does your committee believe in it, as it has been tried so many times only to fail. Either of these methods all alone by itself would do, if in the first case every member of the profession would stay out of competitions, or if, in the second, every one would adhere faithfully to a promise not to compete except under a code. But we know that only a small number will stay out, and equally well are we aware that none but very reputable architects can be long held to a merely informal promise, so by adopting either of the above courses we only try what has been always a failure in the past.

Your committee is therefore of the opinion that although a written restrictive agreement in regard to the code might have some temporary effect, still this only reaches ourselves and our own views as a body, but fails to strike directly at the party who governs the whole scheme and who must be reached.

In short, gentlemen, the architects as an individual, and architectural associations as a whole, have faithfully tried every method founded on governing the designer himself, and have failed.

Now let us try to govern the action of the seducer, who charms away the unwary brother, though he knows the course leads to disaster, and though he is bound by sacred promises to his fellow to abstain.

Let us forsake these useless attempts, and confront the building committeeman. If we can tame him, we are safe. He is our final court of appeal, our Cæsar, and to him must we look for justice.

Your committee, therefore, in order to reach him, recommends that this association at once adopt a set of rules for governing competitions, which rules shall form a code that shall be presented to and urged upon all building committees, when a written request is presented for such action by any member.

We recommend that the president and secretary shall have the performance of this as part of their duties during the year they are elected for. The code can of course be improved and perfected as time goes on.

Now what can we expect from this course? Hope says much, and so does our desire, but judgment dictates that so great a work must show only gradual movement at first, and that full success will not attend the labors of the first year, but you should as wise men determine whether it is worth while, by picturing to yourself the worst side or outcome, and here it is, in the judgment of your committee:

That in the first year we shall only obtain satisfaction in few instances. But, gentlemen, these would be of enormous value on the future practice of our profession.

It is an axiom that the Anglo-Saxon is governed by precedents, and it therefore behooves us to establish such as will properly represent us in this most grave matter.

Your committee has formulated a code to lay before you, and having done so, requests that you first vote on whether this method shall be tried, and afterwards on the construction and terms of the code itself, should the first vote pass.

And in order that nothing be left untried, your committee recommends that in conjunction with this action a paper shall be drawn and signed by all the members here present, that as individuals they will abstain from and keep out of all competitions wherein the essential points of this code shall not have been adopted.

It was suggested in committee that a circular-letter to building-committees be also prepared by you, to be used by the president and secretary of the association, which should state our reasons for adopting the code, and containing a proper request for fair consideration.

It was however deemed better to leave this matter open, as no form suggested was sufficiently elastic to cover all contingencies.

Your committee believes that every abuse known in the past has its indicated cure in some paragraph of the code, and while it may be defective as a whole, it effectually covers our rights as far as they are known up to the present time.

Your committee suggests that only the essence of the code be adopted, and that in the vote permission be accorded to improve the diction and literary form of the document, where it is found to be needed.

The code is written in letter form, to relieve it of the legal document appearance, which of itself might make the paper obnoxious to many who would otherwise adopt it.

CODE.

(To be addressed by building-committees to architects.)

Mr. —— ——, Architect.

Dear Sir, — The —— —— Board has determined to erect a building for the following uses: —

The Board has appointed the undersigned a Building-committee, with full power to select and contract with an architect.

The building is to be located —— ——

And must fulfill the following requirements, viz.:

The cost of the completed structure (not including architect's fees) must not exceed —— ——

The Board is assured by the following well-known building experts —— —— that the building can be completed for the above sum.

The committee hereby invites you to form one of —— —— architects to compete for the position of architect, under the following agreement:

The committee has selected Mr. —— —— as its juryman, and you are invited to meet the competitors on —— —— day —— —— to select your juryman at —— ——

Each design to consist of the following drawings —— —— all to be presented in a uniform style of execution, and to a uniform scale.

All drawings and descriptions must be in at noon on the —— —— day of —— —— 188 —— each set enclosed in a portfolio to be placed in the hands of Mr. —— —— of —— —— No. —— Street, who has been appointed the custodian, and who shall immediately there and then open the portfolios in presence of the competitors, no one else to be present; and he shall cull out every drawing or description in which

is noted anything not in strict accordance with the above restrictions. No competitor to be allowed to put in any alternative or extra drawings, details or sketches.

The committee agrees that the selection of the best design, which also shall carry with it the appointment of the designer, as architect of the building shall rest in an expert jury, consisting of three members, one of whom shall be selected by the competing architects, one by the building-committee, and the third by the other two. The jurymen shall all be expert architects, and not of the town where the building is to be erected. The building committee agree to meet all expenses of this jury.

The jury, publicly or privately, is not to look at any of the drawings for this building other than those that shall be delivered by the custodian, and which have been found to meet the exact requirements hereinbefore set forth, and to base its decision strictly on the merits of the designs so submitted.

The committee agrees that the jury shall be left perfectly free, and that no preference or leaning of the committee, or any member of it, shall be conveyed to any juryman publicly or privately, directly or indirectly, till the decision of the jury has been reached and published.

The committee further agrees, when the competition has been decided, to return each set of drawings except the one presented by the successful architect; and further that no part of any rejected design, that is original as to this competition, shall ever be used in the construction of the building, without the written consent of the designer thereof.

A written description of the building may accompany each set of drawings, the same being presented or printed without any sketches interspersed; and these descriptions shall pass through the custodian's hand as above provided for drawings, and shall be subject to rejection if the requirements are exceeded; and no other writings or descriptions shall be considered by the jury in forming a judgment.

Before any design is finally premiated, the cost of a building shown by it shall be determined by an assessor, who shall be under oath, and who must be satisfactory to a majority of the competitors and the committee.

Should the assessor claim that a building cannot be erected according to any given design for the sum mentioned, the designer thereof shall be heard by the jury before throwing him out of competition on this account. Should the jury than determine that the assessor is right, they must throw out the design which is so shown to be too costly and proceed to premiate another—one of the architects in the competition. Cost of assessor and his expenses to be paid by the building-committee.

The jury shall not allow any personal conferences with any competitor, either in public or in private, other than those proper consultations to be held between the jury as a whole and the individual competitor, for the purpose of receiving necessary explanations in regard to the design.

The jury shall positively premiate one of the designs hereby called for in this competition, and this judgment shall be final and conclusive, the committee reserving the right to afterwards alter or change the one chosen, if desired, but this last clause is not to be construed as revoking what has been said above as to the cost of building from the design when submitted to the jury.

The committee agrees that the permiating of a design by the jury shall carry with it the appointment of its maker as architect of the building, with the regular compensation as allowed by the schedule of charges, adopted by the Western Association of Architects.

The decision of the jury shall be published on or before the —— day of ——

Should any competitor seek any further information than that above stated, the committee must send the answers to him and all others alike, in order to keep each competitor on exactly the same basis as the rest throughout the competition.

All who may come into the competition shall be subject to the same rules as above.

No competitor shall serve on the jury in any capacity whatever, or be allowed to give any advice in any matter relating to this competition.

Should the work not proceed within one year from date of the selection of the design, the premiated architect shall then be paid for what he has already done up to that date, according to the schedule of charges adopted by the Western Association of Architects, his design in competition being ranked as full preliminary sketches. Whenever the work shall proceed thereafter, the premiated architect shall still be the architect having full charge as above mentioned.

Very respectfully submitted,

D. H. BURNHAM, *Chairman*,
C. E. ILLSLEY,
JOHN W. ROOT,
WILLIAM HOLLABIRD,
GEO. WORTH.

Mr. Illsley does not concur in statement that competition has always existed, and is incradicable.

TO THE MEMBERS OF THE SECOND ANNUAL CONVENTION OF THE WESTERN ASSOCIATION OF ARCHITECTS: —

Gentlemen,—It is the purpose of this, the first report of your Committee on Building Laws, to present the outlines of the policy to be pursued in dealing with the many demands made for legislation upon subjects connected directly or indirectly with the practice of our profession.

This policy should be founded primarily upon a recognition of the identity of our individual interests with those of our profession at large, and of the inter-dependence of the interests of our profession and those of the communities and people among whom we live. Nor should we lose sight of the fact, that the effects of ill-considered and hasty legislation are among the heaviest burdens to which the people of our country are compelled to submit.

When future legislation upon each subject is controlled and shaped by those best qualified by their knowledge and experience of the subject, our statute books and the administration of our laws will become the pride and glory, as they are now, in many respects, the shame of our republic. When this time arrives, it will become the duty and the privilege of our professional associations to aid our legislators in formulating the statutes found necessary for the regulation of the interests of the house-planning, house-building and house-using part of our population.

We call ourselves the Western Association of Architects, and it is our desire, by our corporate actions, to serve our fellow-citizens and ourselves. We wish our fellow-citizens to concede that we possess superior knowledge in our profession, and to submit to our guidance in all matters relating to their building interests. We call ourselves architects! By what right can we demand that our fellow-citizens acknowledge our right to the title and grant that we possess that superior knowledge of building matters which it implies? Is it not the case that, while probably each of us is conscious of his qualification to call himself a member of our profession, that the public know us only as a body of business men, self-styled architects, who have by their executed works demonstrated, at the risk of their clients, their greater or less justification for assuming the title of architect?

Here, then, is the key-note of the situation. Let our first and foremost action be an intelligent and energetic effort to fix throughout the States of the great West the legal status of the architect.

To-day we are the professional brethren of every one who may paint the word architect after his name on his sign or print it on his business card, unless the incompatibility of his qualifications and his self-assumed title shall have become unmistakably demonstrated by the most flagrant professional failures and blunders.

The injury to ourselves arising from this state of affairs, though great, is trifling when compared with the constant menace to safety of life and limb, to health and to finances, to which every one who is about to build, or about to occupy a structure already built, is subjected from this cause. This matter cannot be left to the operation of the law of natural selection and survival of the fittest. While the fittest will undoubtedly survive, danger to occupants of buildings and even to passers-by on the street will lurk in the structures reared by the unfit under the auspices of clients who have come to them in ignorance as to their unfitness, and deceived by their title, or who have been lured by cupidity or a misplaced spirit of economy.

The public have the right to demand from us protection against professional charlatanism. This can be secured by a State regulation of the practice of architecture. Let no man be permitted to practice architecture without a license from a competent State tribunal, and let the condition of the granting of this license be that the applicant shall have successfully passed such examination as this tribunal may find expedient for determining his qualification for his professional work, or that in the case of persons already in the practice of architecture, their capability shall have been determined by the successful erection of buildings of such character as may seem to constitute a sufficient test. We submit herewith the draft of a statute, the passage and enforcement of which by each of our Western States will protect the public, will add to the dignity of our profession, and give to our own association and to our various State associations a standing equal to that of the various legal and medical associations.

A BILL FOR THE PROTECTION OF THE PUBLIC.

Be it enacted by the People of the State of —— *represented in General Assembly*: —

1. That every person practising the profession of architecture within the limits of this State shall secure a license or diploma under the provision of this act.

2. The Governor of this State shall within —— from the passage of this act appoint a Board of Examiners, to be composed of five members, one of whom shall be a member of the faculty of the ——, and the others, who shall have been engaged in the honorable practice of architecture at least ten years, shall be so selected, that as nearly as possible, the different sections of the State shall be represented. The term of office of the members of said Board shall be for one, two, three, four and five years respectively, and the successors of each member shall be appointed for a term of five years.

3. Said Board of Examiners shall organize within three months from the passage of this Act, and shall procure a seal and books of record, in which all proceedings of said Board shall be kept. Said records shall be kept in the archives of the Secretary of State, and the Board shall have the power to administer oaths, solicit and receive testimony on all matters relating to its duties. Said Board shall hold its meetings at the State Capital at such times as it may select, and due notice shall be published of the time and place of all meetings of the Board.

4. Said Board of Examiners shall receive applications for diplomas or licenses and act upon them as follows: First—The names of all who are at the time of the passage of this Act engaged in the practice of architecture and who may apply in writing to the Board for license or diploma, are to be published in a newspaper published at their respective places of residence, and if, at a meeting of the Board, no objection is made to the granting of license or diploma to those whose names have been so published, at least thirty days preceding the date of said meeting, the Board shall issue to each of said persons a diploma or license to practise architecture within the limits of the State, without

subjecting them to any examination. But if objection is made by one or more of his former clients to the issue of a license or diploma to any applicant for the same, then the Board shall give the parties a hearing, and if, in the judgment of the Board, the charges made are substantiated and of such nature as to demonstrate the incapacity or unfitness of the candidate for the duties and responsibilities of an architect, no license or diploma shall be issued to him; but such applicants shall not be debarred from seeking for and receiving a license under the rules for examinations hereinafter provided.

5. The Board shall examine all applicants for licenses or diplomas who comply with the following conditions, viz.: (A.) All who are engaged in the practice of architecture at the time of the passage of this act, even if they have been rejected under the provisions of the preceding section of this act. (B.) Any graduate of a university, scientific school, technical college, or training school, and who shall have served for a term of three years after his graduation as a pupil or apprentice of an architect in good standing. (C.) Any competing builder who has served for a term of one year in the office of an architect in good standing. (D.) Any one who has been for six years in the employ or under the tuition of an architect of good standing, two years of which period may also have been served in the employ of a builder in good standing.

6. All examinations shall be made directly by the Board and shall extend over the entire field of the construction of buildings, with special reference to a test of the knowledge of the candidate of the strength of materials and of his ability to make practical application of such knowledge in the ordinary professional work of the architect, and should also seek to determine his knowledge of the laws of sanitation as applied to buildings.

7. The Board shall also issue license or diploma to any one presenting a diploma from the Board of Examiners of Architects of any other State, without subjecting him to any examination.

8. If any architect be accused of gross carelessness or recklessness in the discharge of his duties, and after giving due hearing to the accused and his accusers, the Board shall find him guilty of such offence, his license may be temporarily withdrawn or entirely revoked, as may seem proportionate to the gravity of the offence.

9. The fee to be paid for a license or diploma shall be twenty-five dollars where such diploma is granted without examination, and fifty dollars where it is granted in connection with an examination. These fees are to be paid into the treasury of the State.

10. The members of said Board shall serve without compensation, but their actual expenses shall be paid out of the State Treasury General Fund. They shall be empowered to employ a clerk and stenographer during their sessions at a salary of not more than —— —— dollars per day while employed in the service of said Board.

11. Any person who shall be engaged in the planning or supervision of the erection of buildings shall be regarded as an architect under the provisions of this Act, and shall be held to comply with the same, but nothing contained in this act shall prevent the student or an employee of those lawfully practising as architects under license from said Board, from acting under instruction or supervision of their employers.

13. Any person practising architecture in this State without complying with the provisions of this act, shall be punished by a fine of not less than fifty, and not more than five hundred dollars for each and every offence, to be paid into the State Treasury, but the penalties of this Act shall not apply until six months after the passage of this Act.

We recommend that each of our component State associations begin at as early a date as practicable to urge upon the individual members of our State Legislatures the importance of the passage of this act, and premising upon the probability of its successful adoption, we urge that we unite in an effort to make as high as possible the standard of qualifications of the architects as required by the statute. The more severe the test, the greater the honor, the greater the esteem in which we will be held individually and collectively by those whose building interests it is our desire to control. And while the law providing for this test of our qualifications will neither abolish the operations of the law of natural selection nor prevent the rise and survival of the fittest, we will have the assurance that even the weakest of our professional associates will be worthy of our consideration, and the public will have the guaranty that even the less fit are possessed of some qualification for the work that may be entrusted to them.

IRON STAINS ON GRANITE.

Port Deposit, Md., November 23, 1885.

To the Editors of the American Architect: —

Dear Sirs,—I am building a residence of gray granite, rock face, and my masons in cleaning down the walls preparatory to pointing, used muriatic acid to remove the lime stains from the face of the building stone where mortar had dropped. Unfortunately they used the acid from a tin vessel, and did not discover the fact that the acid had eaten the tin surface from the vessel, and was rapidly being charged with iron, until considerable surface had been gone over, and iron stains was apparent wherever the acid had been used. The stained surface was again gone over with the same acid, and sponged off with clear water, which apparently removed the stain, but when rained upon and after drying out the stains reappeared as badly as ever. Can you tell me how to remove the stains? If so, you will greatly oblige a Subscriber.

[This looks like a serious case. Muriatic acid will sometime bring out iron stains from particles in the stone itself which under ordinary weathering would never give trouble. We should advise trying a thorough washing with a strong solution of oxalic acid.—Eds. American Architect.]

TESTS OF HAND-GRENADES AT THE NOVELTIES EXHIBITION.

Philadelphia, Pa., November 21, 1885.

To the Editors of the American Architect: —

Dear Sirs, — In view of your remarks last week relative to the merits of hand-grenades and similar appliances for extinguishing fires, your readers may be interested in the results which attended some very fair tests, which were made at the Novelties Exhibition, recently held under the auspices of the Franklin Institute in this city.

The tests were conducted by the Superintendent of the Fire Patrol of Philadelphia, who insisted upon having the conditions as nearly as possible like those which actually attend incipient fires, the only class, of course, over which it is claimed that such limited appliances have any control. I say as "nearly as possible" because the make-believe fire in an open lot has after all the very great advantage of getting rid of its smoke, which every fireman knows to be about the most serious obstacle he has to encounter.

All that was insisted upon was that the fires should be about as hot as incipient fires really are, *and no hotter*.

Of course the exhibitors came well provided with tar-barrels and oil-cans, and laughed at first at the idea of any test performed without these time-honored auxiliaries, but the tests were made without them all the same, and failed one after another as each was tried. Only one exhibitor was spared the humiliation of seeing the smouldering fire still smoulder on when he had done his best to stop it, and that was the one who declined the test, saying with delightful frankness that he wasn't going to let the Franklin Institute make a — fool of him.

What you say about the desirableness of having something, even this little, at hand in case of accident is just and to the point, and there is little doubt that the manufacturers of these extinguishers will continue to prosper and to be of use, but there can be no harm in knowing just where the truth lies, after all.

Yours very truly, L. W. Miller.

POUND-FOOT *vs.* POUND-YARD.

Phœnixville, Pa., November 27, 1885.

To the Editors of the American Architect: —

Dear Sir, — In reply to the question of Mr. A. D. Ottewell in your issue of November 21st, concerning the use of a pound-yard standard by American rolling-mills for expressing the weight of shape-iron, it may be said that this is done because of the convenient decimal relation that exists between the sectional area of any bar in square inches and the weight of the same bar or shape in pounds per yard. Ten times the area in square inches denotes the weight in pounds per lineal yard. This is a matter of convenience to the engineer or architect who employs the inch unit of sectional area in designing structures to meet a given set of strains which have been determined by calculation. The elastic limit and safe load of iron or steel in construction are always observed in experiments and described in specifications by reduction to a unit strain of so many pounds per square inch of sectional area, and, the strains upon the several members of any structure having been ascertained, it becomes an easy matter to state the proper areas of these members in square inches. Then the weights of these parts of the structure, or of the whole structure, may be obtained quickly and accurately by a simple conversion of inches into pounds per yard.

Thus the use of the inch unit and the pound-yard standard adopted by most of our American rolling-mills has been the result of experience in the endeavor to combine celerity and accuracy with a minimum amount of calculation. Very truly, Amory Coffin.

THE SCHEDULE OF FEES RECOMMENDED BY THE A. I. A.

Birmingham, Ala., November 20, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Will you please inform us, through the American Architect, the date of the paper which contained the list of architects' fees adopted by the A. I. A.?

Yours respectfully, O. Marble & Sons.

[The revised schedule was published December 27, 1884.—Eds. American Architect.]

THE STONE-SAWING MACHINE.

Philadelphia, November 14, 1885.

To the Editors of the American Architect: —

Dear Sirs, — In the American Architect of November 7, I read an account of a new saw for the quarrying and cutting of hard stone. You also spoke of an article written some months ago. I remember the article, but not the date of paper. Would it be asking too much to inquire of you in what paper (date) it was published, and where I could get a more exhaustive description of it, with a view to getting a machine. Any expense for the getting of the information will be gladly paid by me. Hoping to hear from you, I remain, Yours truly, Robert A. Keasbey.

[See the *American Architect* for May 10, 1884.—Eds. American Architect.]

—1886—

A PRELIMINARY PROSPECTUS.

WE believe that preparations have been made which assure to subscribers to the *American Architect* for 1886 a peculiarly well-balanced and readable journal.

It is not possible to cover during a single year all the branches of art, science, and literature which interest the profession; we have, therefore, selected for treatment during the coming year the following topics: —

"The Processes of Mural Painting," an illustrated series of papers by Frederic Crowninshield, artist, will appeal to those interested in the arts of interior decoration.

"The Science of Building Construction," a series of papers by Louis De Coppet Berg, architect, being the work of a practising architect and not that of a mere book-maker or theorist, will be unquestionably acceptable to the younger men, at least. Mr. Berg, aiming to make his work of the greatest value to the largest number, will confine himself in his mathematical demonstrations to the use of arithmetic, algebra and plane geometry. In short, these papers may be expected to be in the highest sense *practical.*

"The Laws affecting the Practice of the Architect," by T. M. Clark, architect, which will not begin to appear before the last half of the year, will, we believe, form that compendium of laws affecting the practice of the architect in this country and that digest of leading cases under these laws, the present want of which is so serious a hindrance to an architect's understanding his own position as regards his clients and his contractors.

"Ancient and Modern Light-Houses," a series of illustrated papers, by Major D. P. Heap, Secretary of the Light-House Board, besides their value from an historical point of view, will have a very real interest to a profession which has so often to deal with delicate and unusual conditions affecting the stability of foundations and the construction of lofty towers. There is so much of romance attaching to all that relates to storm and shipwreck, that we believe even lay-readers will find enough of anecdotic interest in these papers to hold their attention.

"The Water Supply of Buildings," a series of illustrated papers, by John Pickering Putnam, architect, will serve to indicate that the interests of sanitation will not be neglected.

"Strolls about Mexico," by Sylvester Baxter, will for some time longer do much to enlighten us as to the architecture and style of life to be found in our sister republic. These papers will, as in the past, be illustrated.

"Notes of Travel," illustrated and unillustrated, by C. H. Blackall, architect, and other tourists, professional and unprofessional, will keep our readers fairly posted as to what may be seen and heard away from home.

"The Legendary Art of the Zunis," is only mentioned as the subject of a possible series of papers, whose appearance will depend on the health of Mr. Frank E. Cushing, the well-known explorer, who has expressed a desire to prepare some account of the art of his interesting co-religionists.

"Early Settler Memorials," a very fully illustrated series of papers, by Truman H. Bartlett, sculptor, will discuss the work of some of the most noted American as compared with that of European sculptors.

We feel that subscribers may rest assured that within the ribs of the skeleton we here dangle before their eyes will be found many other things of professional interest and value.

THE ILLUSTRATIONS.

Where so much depends on the interest that the best designers take in making contributions, it is difficult to make any very definite promises. Perhaps the best thing to say is that we are very far from feeling that our illustrations in the past cannot be improved upon by those of the future, and that so far as diligence and endeavor on our own part or on the part of our draughtsmen go, no effort will be spared to increase the quality of the illustrations which to many are the most important part of the journal.

We can, however, promise to subscribers to the

GELATINE EDITION.

that they will receive — without extra cost — twice the number of gelatine plates than were promised them last year; and we may be allowed, perhaps, to suggest a measure of the value of our promises by pointing to the fact that subscribers to this edition have received more gelatine plates this year than they were originally promised.

BUILDING NEWS.

Out of regard for the interests of a large number of subscribers there will be published during 1886, a mid-week supplement, devoted to the dissemination of information concerning new building enterprises. This supplement, small at first, as it makes its appearance in the slack season, will be enlarged as the advance of the building season may require.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

TRADE SURVEYS.

THE vigor in the building trades is exhibited in the larger than usual number of permits that have been issued in six or seven of the larger cities between Boston and St. Louis, during the past week or ten days. The activity is general. Even as far west as Chicago and St. Louis, an unusually large number of permits have been issued for residences, shop buildings, public buildings and warehouses. The same activity is observable in a large number of the smaller towns in Indiana, Illinois, Michigan, Missouri and two or three other adjoining States. The abundant crops have something to do with this activity. The advance in wheat, and the probability of a further advance for the leading products of that great section, account no doubt, for much of the activity which exists, and for the confidence which is found to prevail throughout that rich section. The same influences are at work in other sections, though not to such a marked degree. Even pessimists must admit that the material upon which they are accustomed to erect the foundation of their doubts is scarce. A review of the building operations in the Western States particularly shows that enterprise is taking hold of opportunities with vigor and confidence, and that capital is flowing into localities, which it has heretofore avoided, except under strong invitation. The low price of money and high price of wheat; the low rates of transportation and cheapness of desirable agricultural lands; the comparative cheapness of valuable mineral lands; the relative small capital that is necessary to develop mineral tracts are all inviting capital, enterprise and skill into the West, and this migration of energies is likely to be stimulated during spring and winter rather than retarded. It is a very general statement to say that a great many large manufacturing companies have been recently organized in those States, but nothing else can present the facts as they exist, excepting a detailed statement of companies, purposes, and amounts of capital to be used. The railroad interests in the West and Northwest come first in importance. Investors in Boston and New York are taking fresh and special interest in a number of new railway enterprises in the territory between Ohio and the extreme Northwest. Well-informed railroad builders and promoters of railway enterprises have been consulted with reference to the probable railway construction in that region for the coming year, and express the opinion that no less than four or five thousand miles of road will be begun at least, if not completed during the coming season. High lumber authorities in Chicago, Detroit and in Michigan regions are preparing to cut more timber this year than last, some of them on the assurance that their material will be wanted. Conservative authorities are quietly advising against this course, and the lumbermen argue that the present activity is simply a spurt, and that true wisdom warrants them in going slowly, lest the present healthful upward tendency of prices be arrested. The timber men however feel safe in preparing for the heavy cut, and will make it.

Another very important matter, indirectly affecting the building interests is that of cheaper fuel. A large amount of money is being invested in oil-producing territory, and even as far as Leavenworth, Kansas, boring is being prosecuted, and schemes for boring are being developed with a view of testing the existence of natural gas, in regions where heretofore its existence has not been suspected. The importance of natural gas in our industries is not fully appreciated, because even experts are undecided, as to the extent of the available natural-gas field, or the cost at which it can be used excepting at points quite near the wells. Several long pipe lines are projected. Manufacturers generally are encouraging the construction of pipe lines, and are desirous of using this new fuel in preference to coal. The advantages likely to accrue to Western Pennsylvania manufacturing interests naturally threaten other competing interests, and therefore manufacturers everywhere are anxious to avail themselves of like facilities if they are within their reach. It is probable the natural-gas regions are much more extensive than they are now believed to be, but whether a sufficient supply can be found to affect our manufacturing interests in a general way, is a question which may well be doubted. Experts and capitalists are studying the entire question with great diligence.

The building interests of the country at large are likely to be benefitted much by the expansion of building and loan associations. This popular system has been well tested in New England, Pennsylvania and New York, and has, within recent years been introduced in the Western States, where it is meeting with special favor, particularly in manufacturing districts, and among people of limited means. The building and loan associations of Chicago and St. Louis are quite prosperous. Mechanics, and even middle-class people (for the want of a better name), are adopting this method of securing themselves homes with avidity, and the associations in Illinois and Missouri, according to some recent returns, are well sustained, and, by the good management they are receiving, are giving evidence of their usefulness in stimulating economic habits. Architects in those States report a great deal of building of this character for the coming year. In several large cities throughout the West property-owners are stimulating building activity by inducing the municipal authorities to lay out streets in new sections, and guarantee pavement construction.

It is unnecessary to go far from home to discover evidences of vitality in building operations. Throughout the Middle States very little, if any, cessation is observable. In the city of Philadelphia more permits were taken out in November than in October. In New York city a vast amount of building activity has been developed within a few days, and, according to the statements of some architects there, the winter will be an exceptionally active one. One secret and cause of this is, no doubt, the ability of large blocks of capital to find profitable employment in other avenues. The recent activity in stocks, to which financial journals have called attention as evidences of coming activity, was the outcome of the operations of the small army of outsiders who were anxious to grow rich rapidly through stock operations. But the day of fortune-making in this way, if not gone forever, is casting its lengthening shadows eastward. Legitimate operations may be the rule of the future; wild speculation has had its day; the accumulation of capital must find employment in small sums under the supervision of practical men for general reproductive purposes.

The iron and steel making industries are in a healthy condition. The lumber interests are complaining less of extremely low prices. The supply of wood of all kinds is abundant. Southern lumbermen are preparing for a heavier cut and a heavier shipment upon the opening of spring. A large amount of lumber territory in the interior is likely soon to be developed. Within a short time, it may be mentioned by way of illustration, that three large tracts of land, covered with hard woods and underlaid with coal and ore, have been offered for sale — one of twenty thousand acres, one of forty thousand acres, and another of one hundred and twenty thousand acres — all of which are offered at a price ranging from \$4.00 to \$10.00 per acre. Much more land will shortly be offered, as railroad-building brings it within reach of markets. Manufacturers of building-material are preparing for a more active year. Builders of brick-making machinery, wood-working machinery, the makers of engines and elevators, and a long list of mechanical appliances, are now busy on orders for machinery and appliances, for delivery between January and April.

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

330,865. ELEVATOR-HOISTING DEVICE.—Ruben B. Ayres, St. Louis, Mo.

330,866. WEATHER-STRIP.—John Y. Bassell, Leesburg, Va.

330,870. TRAVELLING DERRICK. — Henry Case, Brooklyn, N. Y.

330,883. CHIMNEY-COWL AND VENTILATOR.—Geo. Fischer, Quincy, Ill.

330,903. COMBINED ANNUNCIATOR AND ALARM. — Frank E. Kingman, New York, N. Y.

330,908. SHUTTLE-PLANER.—Lodowick Leeds, New London, Conn.

330,915-917. METALLIC CEILING.—Albert Northrop, Pittsburg, Pa.

330,942. BURGLAR-ALARM.—Benjamin T. Trimmer, West Bloomfield, N. Y.

330,953. BRICK-MACHINE. — Abel B. Woodward, Nashville, Tenn.

330,957. GLASS OR VITREOUS FACING FOR BRICK FRONTS.—William Buttler, Pittsburg, Pa.

330,965. APPARATUS FOR PROTECTING WINDOWS. —Eugen Diez, Weinsberg, Germany.

330,966. FOLDING GATE AND WINDOW-GUARD. — Crowel M. Dissosway, Philadelphia, Pa.

330,969. FURNACE. — Patrick V. Dwyer, St. Paul, Minn.

330,971. SHINGLE OR ROOF BRACKET. — Edwin R. Elmer, Buckland, Mass.

331,005. WINDOW-FASTENER. — Frederick Sahr, Martinsville, N. Y.

331,006. EARTH-AUGER BLADE.—Anthony Schulte, St. Louis, Mo.

331,025. HOT-AIR FURNACE. — Charles M. Baxter, Lebanon, N. H.

331,041. SASH-FASTENER.—Franklin T. Davis, Mt. Vernon, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

INSURANCE BUILDING. — Chas. E. Cassell, architect, has prepared plans for the Old Town Fire Insurance Co., for a three-st'y marble front building, 20′ x 80′, to be erected on Gay St., w Exeter St., to cost, \$10,000; Fred'k Decker, contractor.

DWELLINGS. — A. S. Abell, Esq., is to have erected a block of 3 three-st'y basement and attic marble front dwells., on lot 60′ x 60′ on Charles St., and a block of 4 dwells. on lot 60′ x 65′, on Boundary Ave.; from designs by Chas. E. Cassell, architect.

Conrad Kurtz, Esq., is to have erected 2 three-st'y brick and Belleville stone buildings, cor. Mulberry and Greene Sts., on lot 30′ x 60′; from plans by Chas. E. Cassell, architect; L. C. McCusker, builder.

BUILDING PERMITS. — Since our last report sixteen permits have been granted, the more important of which are the following: —

Reinle Bros., four-st'y brick building, 43′ x 96′, s w cor. Stockholm and Warner Sts.

J. Frank Griffin, 28 two-st'y brick buildings, w s Woodyear Alley, bet. McHenry and Ramsay Sts.

W. M. Warfield, 2 two-st'y brick buildings, w s Gilmor St., and 2 two-st'y brick buildings, e s Vincent Alley, bet. Ramsey and McHenry Sts.

Gail & Ax, six-st'y brick building, s e cor. Charles and Barre Sts.

C. Taylor Jenkins, three-st'y brick building, w s North St., n Pleasant St.

Jas. McCreery, six-st'y brick building, s w cor. Gorman and Sharp Sts.

Benj. C. Bayne, 5 three-st'y brick buildings, w s Caroline St., com. n w cor. Oliver St.; and 6 two-st'y brick buildings, n s Oliver St., w Caroline St.

Henry and Jas. Schoene, 2 two-st'y brick building, s s West St., bet. Light and Charles Sts.

Boston.

BUILDING PERMITS.—*Wood.* —*Litchfield St.*, near Columbia St., stable, 22′ x 22′ 6″; owner, S. B. Pierce; builders, D. Arcy & Robbins.

Tremont St., No. 1572, dwell., 23′ x 40′; owner, Miss Alice Butler; builder, Wm. Tobin.

Eliott St., No. 46, dwell., 36′ 10″ x 41′ 10″; owner, F. S. Small; builders, Holmes Bros.

Centre St., near Eliott St., manufactory, 52′ x 54′; owner, Jonas Barnard; builder, D. H. Barnard.

Vale St., No. 31, storage, 19′ x 30′; owners, Denison Tag M'f'g Co.; builder, G. E. Sawyer.

Guilford St., near Gordon St., dwell., 20′ x 26′; owner, H. Baldwin; builder, J. A. Vickery.

Guilford St., near Saunders St., dwell., 20′ x 20′; owner, H. Baldwin; builder, J. A. Vickery.

Melville Ave., near Allston St., dwell., 30′ x 36′; owner and builder, A. H. Vinal.

Meriden St., No. 417, dwell., 20′ x 48′; owner, W. L. Sturtevant; builder, Charles E. Day.

Chicago.

BUILDING PERMITS. — W. D. Kerfoot & Co., 4 two-st'y dwells., Robey St.; cost, \$10,000.

Woman's Hospital, two-st'y hospital, 3152-3158 Rhodes Ave.; cost, \$25,000.

Kraus & Meyer, 3 three-st'y stores and flats, 320-326 West Twelfth St.; cost, \$37,500.

M. Alber, two-st'y dwell., 415 Twenty-fifth St.; cost, \$4,000.

G. A. Springer, two-st'y addition, cor. State and Randolph Sts.; cost, \$6,000.

N. D. Frazer, two-st'y addition, 496 West Adams St.; cost, \$10,000.

R. B. Moore, two-st'y flats, 1195 West Adams St.; cost, \$3,000.

C. H. Jordan, three-st'y store and dwell., 339 Milwaukee Ave.; cost, \$6,000.

J. T. Dale, seven-st'y store and office, 308-316 Dearborn St.; cost, \$80,000.

G. W. Smith, five-st'y store, 192-194 Michigan St.; cost, \$24,000.

C. W. Breaga, two-st'y dwell., 2816 Michigan Ave.; cost, \$40,000.

J. S. Kirk & Co., one-st'y addition, 350-360 North Water St.; cost, \$8,000.

Chicago Coffin Co., one-st'y addition, 119 DeKoven St.; cost, \$2,500.

J. Wailer, three-st'y store and dwell., 144 Thirty-fifth St.; cost, \$7,000.

Kansas City, Mo.

BUILDING PERMITS. — J. F. Marks, frame business building, 1013 East Eighteenth St.; cost, \$6,000.

Jas. McCullom, frame house, Wabash Ave.; cost, \$8,500.

S. Strummell, brick business and tenement block, East Ninth and Brooklyn Sts.; cost, \$7,000.

H. B. Prudden, brick house, Thirteenth and Penn Sts.; cost, \$8,000.

J. W. Keefer, brick house, 1509 Penn St.; cost, \$7,000.

A. M. Sills, brick house, Tracy Ave.; cost, \$3,500.

R. S. Damon, business building, 601 Walnut St.; cost, \$3,500.

New York.

BANK-BUILDING. — Nos. 34 and 36 Wall Street are being torn down, and a handsome building, 53′ x 100′ is to be erected by the Gallatin Bank and Messrs. Adrian Iselin & Co. It is understood that the plans of Mr. Geo. B. Post have been accepted.

CHURCHES. — The Mount Morris Baptist Church proposes to build a new structure on the w s of Fifth Ave., near One Hundred and Twenty-sixth St., to cost about \$60,000.

The Central Presbyterian Church will erect a church, 25′ x 80′, on the s s of Fifty-seventh St., 250′ w of Ninth Ave., to cost \$14,000, from plans of Mr. S. A. Warner.

STORE. — A five-st'y stone building, 37′ x 80′, is to be built at Nos. 22 and 24 Lispenard St., for Mr. G. Manley, to cost \$30,000.

FLAT. — On One Hundred and Twenty-fifth St., n s, between Sixth and Seventh Aves., five-st'y brown-stone flat and store, 50′ x 82′, is to be built for Mr. W. B. Donihee, from plans of Mr. John G. Prague.

BUILDING PERMITS. — *West Fifty-eighth St.*, No. 347, five-st'y brick building brick and brown-stone front, flat tin roof; cost, \$30,000; owner, Wm. Loughran, 424 West Forty-sixth St.; architect, Robert W. Tuffenberg, 308 West One Hundred and Twenty-seventh St.

Morton St., n w cor. Bedford St., five-st'y brick tenement, flat tin roof; cost, \$15,000; owner, John Jotten, 240 Forty-ninth St.; architect, Geo. Reister, 347 West Forty-third St.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 520.

DECEMBER 12, 1885.

Entered at the Post-Office at Boston as second-class matter.

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THE Supervising Architect of the Treasury Department has made a contribution to the discussion on the best way of directing the construction of public buildings which is worthy of careful consideration. In his opinion, as expressed in his report to the Secretary of the Treasury, the general control of the Government building work should be vested in a Board, consisting of the Secretary of the Treasury, who should be Chairman *ex-officio*, the Supervising Architect, and three other experts, one of whom should be a sanitary engineer, skillful also in heating and ventilation, the second a master-builder. and the third an architect of ability and experience, who should also act in place of the Supervising Architect on occasion. This Board should pass upon the recommendations of the Supervising Architect, and should make appointments to the subordinate offices in his department; and should have power to establish competitions under such regulations as it might deem proper. These competitions, Mr. Bell thinks, should be confined exclusively to those who have fully satisfied the Board that they possess the qualifications for preparing all necessary drawings and details and for carrying their designs into successful execution. This discrimination, as he says, in favor of those who are clearly entitled to the name of architects, "is but justice to the profession of architecture, and to the Government as well, and upon this careful discrimination will rest the entire question as to whether competition can be successfully and economically employed in the planning of Government buildings." The last suggestion is rather a novel one, but Mr. Bell knows thoroughly what he is talking about, and his opinion in such matters is all the more valuable for differing somewhat from that of other persons. It is noticeable that Mr. Stockslager, who is probably also somewhat familiar with public building matters, was careful in his bill for regulating such work, to reserve the right of selecting, among competitors, those who could prove their skill in construction as well as in design and draughtsmanship; and the repeated instances in which Government competitions have failed of their object through the lack of trustworthiness of the authors of brilliant drawings have probably taught both gentlemen the necessity for the adoption of rigid precautions. On the whole, we prefer Mr. Bell's mode of selection to that of Mr. Stockslager. An inquiry into the practical qualifications of competitors, after their designs have been judged, is always disagreeable and unsatisfactory; while the establishment of a grade of Government architects, open to all in the profession who could prove their fitness to enter it, might, under proper direction, be made a powerful influence for the development of architectural science in this country, as well as for securing the best results of that science for the public service.

AN unpleasant check seems likely to be given to the practice of insuring one's property heavily, and then setting fire to the building in which it is contained, leaving the people who happen to be in the building to get out in the best way they can. Every one remembers the case which occurred a few weeks ago in New York, where a shrewd individual, wishing to go out of business in the most advantageous manner, laid trains of alcohol, gunpowder and petroleum about his shop, over which lived several families, and lighted them. As we recollect, the alchohol and oil got into the gunpowder, and interfered with its combustion, so the fire was put out without much loss, but the ingenuity of the plan seems to have excited the admiration of various persons, one of whom, as the evidence seems to indicate, tried recently to carry out a similar one in the same city. One of the inhabitants of a tenement house on Sixty-fourth Street, who owned property worth less than one hundred dollars, is said to have secured insurance on it for nine hundred. Shortly afterward a fire broke out in the building, which spread very rapidly through it, driving nearly two hundred poor men, women and children into the street. Three persons, a widow and her two children, were unable to escape, and were burned to death. The astute over-insurer of his property was arrested, on suspicion of having set fire to the building, and awaits trial. If he is convicted, he will, under the laws of New York, suffer the penalty of murder, this being the name which the statute regards as applicable to the practice of sacrificing human life by reckless or premeditated incendiarism. According to the unanimous testimony of insurance experts, intentional fires form a very large proportion of all that occur, and as persons who have their plans laid for a speculation of this kind are not always deterred from executing them by the fear of endangering others, the example of a successful operator meeting death on the gallows would have a very salutary influence on those who might otherwise desire to imitate him.

WE commend to the attention of hotel-keepers and others the novel but effective plan which has been unintentionally devised by the "Operative and Progressive Painters' Union" in New York, for advertising the Fifth Avenue Hotel in that city. It happens that one of the proprietors of the hotel was so rash as to employ not long ago some painters not belonging to the union, and was notified in consequence that the vengeance of the trade would be visited upon him unless he discharged them forthwith. He was manly enough to disregard this threat, and to stand by his workmen, and the hotel in which he has a part interest was, after the contemptible and criminal fashion of the labor associations, laid under that species of interdict which, from the name of the Irish farmer who was first made to suffer by it, is known as the Boycott. The cause of the painters' society was taken up by the Central Labor Union, and a small army of the mercenaries employed by them was set in motion against the hotel. Pickets were stationed to watch those who registered their names in the books, and circulars bearing the Union seal were subsequently sent to them, as well as to various persons prominent in other cities, requesting them not to patronize the hotel in future, while other messengers were, it is said, to be despatched to board the steamers entering the port, with appeals to the passengers to avoid it also. As any man of decent spirit would, if he knew the circumstances, make a point of placing himself by the side of the hotel proprietors in their struggle against such a dastardly attack, it need hardly be said that the circulars have produced no perceptible diminution in the number of guests at the house, and we are glad to believe that the attempt to injure many innocent persons in revenge for the unsatisfactory conduct of one is likely to have a result precisely contrary to that which was intended.

A RATHER curious question of the division among several persons of responsibility for defects in a building is treated in *La Semaine des Constructeurs*. M. Ravon, the "Secretary of the Committee on Jurisprudence," who signs the articles relating to these matters, seems to be regarded, in many cases, either by himself or on behalf of his committee, as a sort of referee, and his replies to questions often take the form of an award, as if the parties had been satisfied, as they well might be, to submit their disputes for final settlement to his learning and impartiality. In the present case, a schoolhouse was constructed under the direction of an architect. The floor of the main room, which was twenty-nine by twenty-three feet inside the walls, was framed with two girders, twenty-three feet in span, dividing the floor into three equal bays, which

were filled in with short joists. The main girders were specified to be eleven by twelve inches, but were actually put in less than eleven inches square. On these rested the usual solid French flooring, together with two partitions, nine feet high, made of bricks on edge, plastered both sides, which divided the space into three rooms. It is hardly necessary to say that the girders bent under the load, and braces were inserted at the ends, to support them from the wall below. This device, however, although it palliated the main difficulty, introduced others, for, the girders continuing to bend, the braces pushed against the walls, which cracked and bulged. Experts were called in, who reported, not only that the girders were too weak, but that the foundations were poor, and the walls badly built, with joints too thick, and with bad mortar. They, however, decided that the whole responsibility for the failure of the work should be borne by the architect.

M. RAVON, whose opinion is requested on the matter, takes a somewhat different view. It is evident that, either by carelessness or miscalculation, the girders were specified of little more than one-third the proper strength, but as the disorders produced by their weakness were aggravated by the fact that they were actually put in of considerably smaller size than the specifications required, as well as by the improper bonding and bad mortar of the walls, all of which were negligences or frauds on the part of the contractor, it seems to him unreasonable that the architect should bear the whole of a loss which would have been much less serious if the contractor had done his part of the work faithfully, and that the latter should get off safely with all the profits of his bad work. For this reason he declares that the contractor's responsibility is involved with that of the architect. The fault of the latter he regards as the more serious, since such a floor construction would probably prove insufficient, even with well-built walls; and he considers that his failure to discover and condemn the bad work of the contractor deprives him to a certain extent of that defence against the claim for damage, so that in his opinion an equitable division of the cost of putting the building in proper condition would be to lay two-thirds of it on the architect, and the remaining one-third on the contractor.

WE make no apology for giving a short abstract of the important paper read by M. Pasteur before the French Academy of Sciences, on the twenty-sixth of October, on the prevention of hydrophobia after a bite. *Le Génie Civil* presents the paper in full, and we suppose that architects are nearly as subject as engineers to the attacks of mad dogs. Every one knows something of M. Pasteur's study of the diseases of malignant carbuncle and hydrophobia, and of his endeavors to establish a reliable process of inoculation against both these terrible afflictions. His success with the carbuncle has been complete, but hydrophobia is so dangerous and awful a malady that until this summer he had not ventured to push his researches beyond the experimental stage, although his experiments had brought him very near to the certainty which he desired. In a few words, M. Pasteur's theory may be said to be that oxidation, by exposure to air, is capable of attenuating the virus of what may be called the microbean diseases in such a way that upon introduction into the system they will produce, not the precise disease which produced them, but a mild variety of it, the effect of which upon the system is to fortify it against the infection of the original disease.

THE experiments through which these conclusions, so far as regards hydrophobia, were reached, were made upon rabbits, in which hydrophobia of the most violent type is easily and quickly produced. In animals suffering from this disease the specific poisonous matter collects especially in the spinal marrow, and M. Pasteur, in his various series of experiments, usually begins by removing with the trepan a portion of the skull of a rabbit, and inserting, just on the surface of the brain, a small quantity of the spinal marrow of a dead mad dog. After about fifteen days the rabbit is attacked with hydrophobia, and soon dies, and a portion of its spinal marrow is then inserted in the brain of another rabbit; and so on through a long series. After a few inoculations, the strength of the virus is shown to increase, by the lessening of the period of incubation of the disease, and at the twentieth to the twenty-fifth successive inoculation the period is found to be reduced to eight days. For twenty to twenty-five more inoculations the period of incubation remains the same, and then drops suddenly to seven days, where it has remained until ninety successive inoculations have been made. At this point, which is, so far, the limit of M. Pasteur's trials, a tendency to a further shortening of the period begins to be observed, through the still increasing virulence of the poisonous matter. With rabbits, the course of the disease is so regular and certain that the substance of the spinal marrow is a poison of a definite quality, the effect of which in its normal state can be counted upon with precision, and the conditions under which it becomes modified are thus easily recognized. The agent through which it is sought to modify it being the oxygen of the air, the marrow of the dead rabbits is carefully separated, and hung in vials, containing pieces of caustic potash, which remove all moisture from the air. Every day a portion of one of the drying marrows is rubbed up with sterilized bouillon, and injected with a hypodermic syringe under the skin of a dog. It is found that the marrow loses its virulence day by day, with a rapidity varying with the temperature, the thickness of the mass, and the dryness of the atmosphere; but in two weeks it has generally lost the power of producing hydrophobia. A dog inoculated with the virus which has been oxidized for two weeks may, however, be inoculated two days later with virus one or two days more fresh without evil effect; and two days later a portion of virus fresher still may also be introduced into his system without harm; and so on, increasing the power of the poison by successive stages until virus perfectly fresh, which would destroy an unfortified animal in a week, is injected into his veins, or upon the brain, without harm. Even where a dog has been previously bitten, or inoculated with pure virus, the application of this process during the incubation of the poison will, as many trials show, prevent the disease from declaring itself.

THIS is the method of inoculation, as applied with unvarying success to dogs, fifty of which, thus rendered invulnerable to hydrophobia, had been collected in M. Pasteur's laboratory when he was unexpectedly, and, as he thought, prematurely, called upon to use his science for the benefit of suffering humanity. One morning in July last, three persons presented themselves at his door. One was a grocer of Meissengott in Alsace, who had been bitten by his own dog, which had gone mad. The second was a boy, nine years old, who had been attacked by the same dog, and the third was the mother of the boy. The child was frightfully injured. The dog had thrown him down, and bitten him in fourteen places, on the legs, arms and thighs, and, when killed and dragged away, had left him covered with froth and blood. The stomach of the dog was found full of straw and fragments of wood. The grocer, showing that the dog's teeth had not penetrated the skin, was sent home without treatment, and two of the most eminent physicians in France were summoned to see the boy. Although an attempt had been made to cauterize the wounds, the physicians decided that his death from hydrophobia was almost certain, and after a consultation it was decided that M. Pasteur, notwithstanding the heavy responsibility which the attempt involved, should make an effort to save the child's life. The time was short, as three days had already elapsed since the bites had been inflicted; and two inoculations were therefore made on the first day of treatment, one in the morning and the other in the evening, with virus fourteen days old for the first, and twelve days old for the second. The next day two more inoculations were made, with virus eleven and nine days old; and one inoculation was made on each subsequent day, with virus diminishing in age by regular steps of one day. On the tenth day of treatment virus one day old was injected, and the process was then stopped, the patient having shown no bad symptoms whatever. At the time of each successive inoculation of the child, a rabbit was inoculated with the same virus. The inoculations of the first five days produced no effect on the animal; that of the sixth day produced death by hydrophobia in fifteen days, showing its strength to be about that of the ordinary mad dog. That of the seventh day caused death in eight days, and those of the last two days of treatment in seven days, showing that this virus retained its excessive violence undiminished. The boy was kept in the house for a month after the last inoculation, and, no symptoms of disease appearing, he was then sent home, and had continued in perfect health up to the time of the lecture. Soon after another patient was received, who is now under treatment, and last Wednesday four boys, bitten by a mad dog in New Jersey, sailed from New York for M. Pasteur's laboratory.

TUSCAN CITIES.[1]



John of Bologna's Devil, Florence.

MR. HOWELLS has written and Mr. Pennell has illustrated, a very charming book — one of which it is hard to say whether it will prove most charming to those who have or to those who have not yet visited the scenes that it portrays. It is not an amateur hand-book, or an artistic treatise, or an historical summary. It is primarily, a record of personal impressions. And though it has enough of historic information to give it solidity, and enough of artistic description—indication would perhaps be a better word—to give it a picturesque flavor, yet even the historic, and still more the artistic factors are imbued with the general personal quality of the book. We are bidden to view the physical and historic and artistic features which are brought before us less as they appear in the cold, clear light of abstract criticism than as they appear in the dimmer, yet warmer and more sympathetic reflected light of the author's own individuality. In this fact lies much of the peculiar charm of the book — in the fact that it interests us not only in the things which are written about, but also in the man who writes. And as Mr. Howells (much though he has written in the "international" vein, and often though he is undiscriminatingly bracketed, as essentially akin to him, with his friend and rival the cosmopolitan Mr. James) preserves to a marked degree a typically American eye and mind and voice, we see, in seeing him, something like a picture of the typical, cultivated, but not professedly learned or artistic American on his travels. And this, while it adds, of course, a value for his home audience, ought to make his book especially popular abroad; where no natural product is more curiously studied just now than the typical American.

Mr. Howells, if I must explain just what I mean, seems to me a typical cultivated American, because of his mental alertness and catholicity — his openness to new impressions and pleasure in them, just because of their novelty; in his lightness of temper covering a mood that is at bottom serious; in his humor; and especially in the way he combines his satisfaction in his own country with his delight in other countries; his satisfaction with his own century, with his delight in all that the centuries of the past have left behind them. No one is so keenly appreciative of the charm of the old world, of the fascinations of bygone periods, as is the typical intelligent American; yet no one is less likely than he to wish that he had been born in another place, or at another time. He may like to live abroad better than to live at home, but he would not like to *be* anything but what he is. Or, if there are some exceptions to this rule — there may be, though I cannot affirm it — why, then, they are not typical Americans, but strays and aliens and human curiosities: and as such they need look for no reflection of themselves in Mr. Howells's page. If I may try once more to mark the especial attitude assumed therein, I shall venture to call it the attitude of *detached sympathy* — the attitude of one who is acutely sensitive to all that he sees in each new land, and all that he reads of each dim century of old, but keenly conscious of himself at the same time, keenly alive to the fact that he is among these things but not of them, that his sympathy is imaginative, not bred in his flesh and bone; and to the fact that all he sees and all he says of what he sees owe a great part of their color and their flavor to his own eye and to his own mind. And this, I repeat, is the attitude of the average intelligent American — cosmopolitan in sympathy, distinctly trans-Atlantic and individual in analysis of that sympathy. But while thus marking what Mr. Howells has in common with others, we must not forget to mark and underscore that which is his by right of personal endowment — the power to analyze his personal and his external facts with exquisite clearness, and to reproduce his analyses with equal felicity of thought and word. Often enough have the cities of Tuscany been described; but seldom indeed has their flavor, their character, their *quality*, been so delicately felt, so subtiley embalmed in words — whether from a Yankee or from any other point of view. Nothing less than this, perhaps, would justify a new treatment of so hackneyed a theme. But so amply does this justify Mr. Howells's effort that while reading him we cannot even recollect that his theme *is* hackneyed. The book is as fresh and our pleasure in it as fresh as, we feel, were the author's own impressions.

Half of the volume is occupied with Florence; half of what remains with Siena; and briefer chapters deal with Pisa, with Lucca, with Pistoja, Prato and Fiesole. The Florentine chapter is the most "serious" and not the least delightful. It paints the general aspect of Florence very charmingly, disentangles certain chapters of the city's history very deftly, and portrays some of its chief incidents and personages in a singularly vivid and painter-like way. Even many who thought they knew their Florence pretty well will know it a good deal better — or, rather, will *feel* it a good deal more keenly — after following Mr. Howells in his delightful excursions through the bloody and brilliant, the shocking and seductive, the brutal and refined, the largely reprehensible but wholly enchanting pages of its story — pages where these qualities appear, not in a separate and successive, but in a friendly and contemporaneous and closely-intermingled, fashion, that has hardly a parallel in the records of the legends of the world.



A City Gate, Siena, Italy. After an Etching by Joseph Pennell.

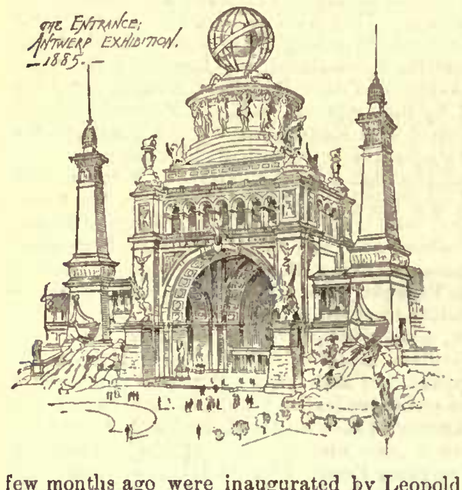
The weakest part of Mr. Howells's book, from the point of view which will be held by most of my readers, will seem that part which deals with things artistic. It is but incidental to the general scheme, as I have said, and its very shortcomings help to make up what I have called the typical value of the book. But the student of art, at least, would have been content if in this one point Mr. Howells had been a little less broadly typical, a little more narrowly representative of what many if not as yet *most* cultivated Americans feel and know about such things as the artistic treasures of Tuscany. Yet it must not be supposed that Mr. Howells ever writes in the Philistine vein, ignorantly undervaluing or contemptuously denying the worth and interest of things which other men delight to praise, simply because to him, who confessedly knows less about them, they do not seem very interesting or wholly worthy. Here, as elsewhere, it is nothing more dogmatic than a frank personal opinion which he professes. And the humorous self-raillery in which he indulges when conscious that his impressions and emotions do not come up to that standard of enthusiasm which the accumulated artistic sense of generations has set up as a criterion of appreciative insight, is always entertaining and is always instructively incisive in its truth to average inartistic American human nature. I should add, also, he never shows a want of respect for that which is delicate in taste and artistic in literature

[1] "*Tuscan Cities*," by William D. Howells. With illustrations from drawings and etchings by Joseph Pennell and others. Boston: Ticknor & Company, 1886.

except (as I remember) in one single instance — except where, in speaking of the great architectural group at Pisa, he ventures to compare it with certain familiar utensils of kitchen service. But for this sin of commission, and for all minor sins of omission, we are more than ready to forgive him, since he has touched on numerous other points with suggestive delicacy, if not with descriptive accuracy; and since he has sketched for us the general effect, the *presence*, so to say, of these Tuscan towns as to my knowledge it had never been sketched before. Even an architectural student of the most bigoted sort will allow that to have had such a sketch made for him is a claim upon his gratitude — will gladly place it on his shelves and in his memory beside more serious studies of special objects and of individual details.

M. G. VAN RENSSELAER.

THE ANTWERP EXHIBITION.



ANTWERP, on the River Scheldt, the commercial metropolis of busy, industrious, overpopulated little Belgium is this year celebrating, by an international exhibition, the jubilee of her railway system; this country, having been the first on the Continent to adopt the iron track. During the last twenty years her commerce has increased six-fold, while that of London and Liverpool have only doubled. But a few months ago were inaugurated by Leopold II, King of the Belgians, and now also sovereign of the Congo Free State, two miles of quay wall, which, while they improve the navigation, also permit of vessels like the "Westernland," largest and newest of the Red Star liners, to approach at any state of the tide, and discharge their cargoes rapidly by means of hydraulic cranes.

The Exhibition, originally a private undertaking, has been taken up, first by the Antwerp municipal authorities, and afterwards by the Belgian Government, so that it takes rank among official exhibitions. The exhibits are classed under the five heads of (1) education and the liberal arts, (2) industry, (3) commerce and navigation, (4) electricity, and (5) agriculture, including horticulture. The Exhibition, occupying the site of the Southern Citadel, built by the cruel Duke of Alva, while Belgium was under Spanish dominion, covers 220,000 square metres, or 55 acres, of which 91,450 square metres, or 22 acres, are roofed over. The architect is M. Bordiau, of Brussels, who designed the Brussels National Exhibition of 1880. The monumental portico, a vignette of which heads this notice, is half as large again as the Arc de Triomphe, at Paris, though its full size is scarcely realized at present, on account of the adjacent shedding, of the usual exhibition type. The structure is, however, to be preserved, and the iron frame-work, which weighs only 450 tons, will be covered with plate-iron, instead of boards as at present.



A Sienese Farm-House. After an Etching by Joseph Pennell.

The portico is 68 metres or 223 feet high, by 66 metres or 216 feet wide, and is surmounted by an open ironwork sphere 10 metres or 33 feet in diameter. The opening is 21 metres or 69 feet wide, by 25 metres or 82 feet high; and the portico is flanked by towers of the same construction, 54 metres or 177 feet in height. When the façade was freshly boarded and painted, it looked very well; but now that the sun has made the boards shrink, so as to show the joints, the near effect is not so pleasing. At the Brussels Exhibition of 1880, the temporary wooden portion of the façade was stretched with canvas, and then painted the same color as the stone, so that it was difficult to distinguish between the two except on close inspection.

The internal chambers in the bases of the towers are devoted to demonstrations of long-distance telephony. In one of them the receiving instruments are put in electrical communication, by means of the existing telegraph-wires (on the system invented by M. Van Rysselberghe, head of the Brussels Observatory) with the Wauxhall Gardens in the Park at Brussels, whence, until recently, the concert given nightly by the orchestra of the opera could be heard distinctly, the distance between the two cities being 50 kilometres or 31 miles. Thanks to the same system, the Queen of the Belgians was able to listen to the opera of "Faust," performed at Brussels, from her châlet at Ostend, a distance of 125 kilometres or 78 miles.

Without going too deeply into technical details, it may be mentioned that the success achieved by M. Van Rysselberghe is due to his having found means, if not to entirely suppress, at any rate to considerably diminish the *induction* in telegraph-wires, by the use of *graduators*, which render the interruption and renewal of the current less brusque, and on that account inaudible by the telephone. In the other chamber, Dr. Ochorowicz exhibits his thermo-microphone, a loud-speaking telephone, in which the current of electricity is said to be generated by heat. Though the receiving instruments are placed on the walls of the large chamber, visitors standing in the middle can distinctly hear speech, singing and instrumental music from a distance of 800 metres or 875 yards. Demonstrations are also given with the magnetic telephone of the same inventor, in which a powerful magnet, having the form of a split tube, takes the place of a battery, and the transmitter and receiver are combined in the same instrument.

An hydraulic lift takes visitors to the top of the portico, whence, on clear days, a good view is obtained discovering the plains of Flanders, part of them, like Holland, beneath the level of high water, and the sinuosities of the Scheldt, a tolerably large river for the Old World. The Red Cross Society, whose headquarters are at Geneva, occupies an annex put in communication with the rest of the grounds by a lattice-girder bridge on the Cottran system, easily taken down and re-erected. This society opened a competition for a special prize, given by the Empress Augusta of Germany, for the best portable hospital, which, however, does not appear to have attracted many competitors, as the Diploma of Honor is awarded to the Decker portable building, which consists of a timber framework covered with canvas, made by Christoph & Unmack, of Copenhagen, and which won a gold medal at the London Health Exhibition of last year.

A portable bridge on the system of M. Eiffel, a large Paris contractor, puts the main portion of the Exhibition in communication with one of the new docks, forming the maritime section. Here, in a vessel constructed especially for its conveyance, is exhibited an interesting relic of prehistoric times, the giant fossil oak found in the alluvial bed of the Rhône on the 25th of March, 1884. The age of this fossil tree, the wood of which in cross-section resembles ebony, is estimated to be twenty centuries, independently of the time during which it remained in the bed of the Rhône. It is 31 metres or upwards of 100 feet long, and 9 metres or 30 feet in circumference at the base, while it weighs about 55 tons.

The cascades on either side of the main entrance to the building are maintained by pulsometers, each discharging 4,000 litres or 880 gallons per minute. One is a Neuhaus pulsometer, with ball-valve alternately closing and unclosing two orifices in a gun-metal sheathing, and making, with the foot-valves, five in all. The other is by Körting, with a plate-valve oscillating between the two orifices. In the grounds are elegant châlets and kiosqusc for the bands, the French and Viennese restaurants, Ceylon tea and Brazil coffee houses, the Flemish pure-milk shop, the Kemerich *bouillon*, the Brodt *weinstube* from Bingen on the Rhine, and the Grüber *bier-halle*, etc. A large building, after the style of a Buddhist temple, guarded by a coal-black *spahi* and a French sailor, contains specimens of the varied products of the French colonies; while a smaller construction in Mauresque style, decorated with the Portuguese colors, blue and white, serves to display the colonial products of Portugal, and also as one of the entrances to the main building. An enclosure, with several native huts and a larger erection in the same manner, contains all that could be brought together from the Congo, so intimately associated with Stanley. Here, too, until the weather became too cold, King Massala, with his black family and suite, held levees daily under the new Congo flag, a gold star on blue ground. Near the principal entrance to the grounds is a reproduction of a Manitoba farm, with emigrant hut and farming implements, where all information is afforded as to emigration and colonization. Opposite the farm are two new wind-motors, pumping water. In one of them, called an atmospheric turbine, by A. Dumont, of Paris, the volute-shaped vanes are arranged in a light, open ironwork drum; and in the other, by G. Van Hecke, of Ghent, the flat vanes present automatically more or less surface to the wind, in inverse ratio to its

force, so as always to give out a constant degree of power. A prominent object is a fac-simile of the 100-ton hammer with 5-metre fall, made by the Cockerill Company, of Seraing, for the new steel-works at Terni, Italy, to be driven by air compressed to 75 pounds per square inch, by compressors driven by water-pressure engines.

There is in the grounds a good display of Belgian building-stones, and also marbles, some of which latter are very beautiful, such as the black-and-white Sainte Anne, the Rouge Royal, the Rouge Rose and the Rouge Griotte. Those sent by the Société Anonyme des Carrières et Usines à Marbres de l'Entre-Sambre-et-Meuse are sawn by a twisted wire cord, which turns upon itself while travelling rapidly and carrying wet sand along with it, while columns are formed by a mechanical perforator cutting out an annular space round them from the solid block. A handsome garden or park seat is shown by P. J. Wincqz, formed by a single block of Soignies stone, sculptured below and polished on the top. This stone, of a dark-gray color, largely quarried and used in Belgium, called *petit granit*, though really a limestone, is cheap, useful, easily worked and effective.

Chevran-Lorrain, of Paris, has put up a pleasing and yet inexpensive building, to illustrate his system of attaching slates to roofs, and also forming a substitute for walls in temporary structures. In the latter case, laths, rather stronger than usual, are nailed to the uprights of a light timber frame-work, and to these are hung the slates — at Antwerp they are alternately black and pink — by hooks made of copper or galvanized-iron wire. A cheap roof of galvanized-iron tiles, for iron or timber frame-work, is shown by Retterer & Bellot, also of Paris. Thanks to a double joint at the edges, which are tubular, these tiles are, it is claimed, perfectly water-tight, preventing any infiltration of water by capillary attraction, while also withstanding great pressure compared with their slight weight. They occupy but little space when packed, and are easily and quickly laid. C. Ommeganck has erected the model of a building, one-fifth actual size, showing his system of lightning protectors. For cheapness, he makes the point of nickel instead of platinum, protects with a lead pipe that part of the copper conductor which enters the ground, and places an extensive layer of gas-coke above the first water-bearing stratum reached, for dispersing the electric fluid.

The ironwork shedding of the main building was put up in about equal portions by three companies, the contracts being made on the basis of their regaining possession of the materials at the beginning of next year. The Cockerill Company, who erected the machine-hall, will re-erect the building elsewhere next year; but the other two companies, the International and La Métallurgique, have got out the details of their portions so as to preserve the bars in as long lengths, and make as few holes in them as possible. In their case the stanchions consist of two channel-irons placed back to back, with distance-pieces between, and clamped together by wrought-iron clips shrunk on hot. Only a few holes are punched at the top to receive the lattice-girders while the bottoms are simply dropped into cast-iron bases with recesses made to receive them. The roof-spans of the nave and transept are arched, while those of the smaller *galeries*, as they are called, are mainly of the Polonceau type. As a rule, the roofs are left in their natural state, and in some cases the stanchions are simply coated with a silver lacquer, used extensively on the Continent of Europe for iron furniture, such as chairs and bedsteads. In others, however, they have been encased in wood or plaster, forming ornamental columns to harmonize with the general decoration. Thus, in the Russian section, the characteristics of that country's somewhat gaudy and Eastern architecture are strongly marked, while the façade of a log cabin is adorned with the elaborately cut-out and crossed barge-boards that are so common in Russia. To dismiss this section, the bronze castings of warlike and hunting groups possess remarkable spirit and reality.

At the intersection of the nave and transept, is an imposing trophy made up of the many and varied products of home and foreign growth, which constitute the trade of Antwerp. Near it, is another contributed by the three bathing and fishing stations of Belgium, viz.: Antwerp, Ostend and Blankenberghe, and also a collective exhibit of the various Belgian collieries, under the protection of the society for fostering national industry, with a complete reproduction of the underground workings of a colliery. A good damp-proof floor, for laying down directly on the ground, is shown by T. F. Bierhorst, of Brussels; it consists of half-pipes cast with external flanges, laid with the convex part downwards, and filled in with timber, with a layer of asphalte between the two. The floor boards are laid across, being nailed to the timbers filling the half tubes, with asphalted felt between. A light iron structure is erected in the Belgian section, with fire-proof floor composed of rolled joists with the spaces between filled in by *vousettes*, or blocks of concrete forming an arch. The façade is artistically treated by Wouters-Koecks, of Molenbeek-Saint-Jean, who has formed a light trellis-work with various creeping plants, all beaten out of iron with the hammer. In the same line, L. Von Boeckel, of Antwerp, has forged out of wrought-iron a couple of trees with all their intricate roots, foliage and flowers, and also a well-head after the celebrated one at Antwerp made by Quentin Matsys, blacksmith and artist, a statuette of whom in wrought-iron, is also contributed by his follower. The Vieille Montagne Company have put up two pavilions to demonstrate the application of their zinc plates, both to the internal lining, and also the external covering of buildings for counteracting damp. The two erections are in different styles; and the imitation of brick and stone on the zinc, by means of potassa-silicate paint, quite deceives the eye. This company has brought out a new joint for the zinc sheets laid on roofs, which they claim to effectually prevent, not only direct entrance of rain, but also its infiltration through capillary attraction. A column has been constructed by Dufossez & Henry, of Portland cement, with little bits of quartz and other stone mixed with it, and the whole polished so as to form a good imitation of various granites, at a greatly diminished cost. One of the most beautiful objects in the exhibition is a large altar-piece in polished white marble, adorned with statuettes in pure white marble unpolished. It is by Modeste Verlinden, of Antwerp, who has sold it twice over, and received two gold medals from the jury. He quotes the price of 60,000 francs or $12,000 for a similar work in the Italian, Gothic or Renaissance styles.

The French Republic has a handsome court for showing the Government manufactures of Gobelins tapestry and Sèvres china. The Austrian section, where some beautiful porcelain is exhibited, is partly enclosed by two pairs of old wrought-iron gates, supposed to have been designed by the architect Villemans, and made at Vienna two hundred years ago. They have remained ever since in the park of the Schlosshof, formerly belonging to Prince Eugène, and now bought by the Austrian Government, who have lent the gates for exhibition. The pavilion of Prince Rudolf, of Austria, octagonal in form, was designed by the Imperial architect, Professor Storck, and is sumptuously adorned with Eastern carpets and hangings, Venetian glass and elaborately-carved cabinet and chiffonnier.

It is somewhat remarkable that a little country like Belgium, with an area of only 11,313 square miles, should have succeeded in bringing together exhibits, not only from nearly all the European States, including Servia, Luxemburg and even Monaco, but also from many in the three other continents. Thus, the United States of America, Canada, Hayti, Brazil, Paraguay, Australia, Liberia and Japan are represented. The exhibits from the principality of Monaco, with a population under 1500, make quite a respectable show, being contained in an elegant pavillion, in the individual style of the country, something between Spanish and Mauresque. A plaster model of the cathedral, with Norman arches, an Italian Campanile, and two smaller square towers at the junction of the circular chancel with the nave, is sufficiently large to give a good idea of that imposing edifice. A terra-cotta bust of the reigning Prince, Charles III, is surrounded by some effective terra-cotta vases, in which the usual red color is set off by white ornament in relief. Some artistic *Barbotin* ware is also sent, including a few unpainted samples, in imitation of basket-work, and elegant furniture in olive wood, both plain and decorated. Of course the leading industry of Monaco is not represented; but there is a collection of native coins from the earliest ages of its existence. The Grand Duchy of Luxemburg, which is an independent State, with an area of 980 square miles (the reigning King of Holland being hereditary Grand Duke of Luxemburg), has a large court all to itself, filled with many interesting objects. Besides products of the oölitic iron ore, Luxemburg's little fortune, its millstones, gypsum and marbles, there are some neat floor tiles, and specimens of earthenware and other manufactured articles, including watches. The Government Department of Agriculture has obtained a diploma of honor for its system of draining and irrigation, plans of which are exhibited. There is also a quarter-size model of a multiple sluice, in which the nuts of the vertical gate screws are connected by a link and worked up or down, or some up and some down by the same motion of a single lever, acting through keys placed with their bevelled lower ends in one or the other direction in the nut boxes. The same action is applied by the constructor, M. Emile Servais, civil engineer, to a new wine or apple press, the screw being worked down by a ratchet-brace movement. The same inventor shows an obturator, or hermetic-closing apparatus, for sewer man-holes, which consists of a cone kept up against its seating by weights attached to chains passing over pulleys, until the quantity of water above the cone overcomes the weights. The water then runs down into a pan below, and when this is full, it tips and discharges itself, allowing the cone to rise and again form a tight joint with its seating. M. Servais also shows two new tipping wagons of his design, which can easily be tipped, when loaded, by a mere lad. In one of them the axis moves through a curve during the process of tipping, and in the other, the axis is chosen between the axal centre of gravity in the full and that in the empty wagon.

The bridge over the Rue de Bruxelles, which affords communication between the main exhibition building and the machine hall, gives access to a balcony running round three sides of the hall, and affording a general view of the machinery in motion. Dr. Nayer, of Willebroeck, shows the process of paper-making in operation; and the Cail Company of Paris, have sent a De Bange cannon of 346 millimetres, or thirteen-and-a-half-inch bore, with bi-conical rings intimately connected together, and with the central tube. The Sociéte Marcinelle et Couillet have put up a castellated gateway, composed of iron plates and bars of various sections, as an entrance to their stand; and the Providence Company that has iron works both in France and Belgium, shows a collection of rolled joists for buildings, including one 508 millimetres, or twenty inches high. Gustave Van Hecke has sent a weighing-machine on the Schenck system, which prints the weight in consecutive figures on a horizontal line, easy for reading. The transept and machine-hall and grounds are illuminated by electricity; and a captive balloon is added to the attractions. A metre and normal guage tramway about two miles long, has been laid down between the exhibition at the Eastern station, on which all the automotive tram-cars entered, including an electric car,

the Beaumont compressed air-car, and the Rowan steam carriage, run regularly in turns in competition for a special prize offered for efficiency and economy of working. J. W. P.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THORN MOUNTAIN HOUSE, JACKSON, N. H. MR. WILLIAM A. BATES, ARCHITECT, NEW YORK, N. Y.

THE group of buildings herewith illustrated, is known under the collective name of the Thorn Mountain House, although each has its own individual and picturesque designation. When originally opened to the public, it was a rambling old farm house, situated upon the eastern slope of the mountain, with Mount Washington some thirteen miles away to the north, Giants' Stair on the west, and Moat and Iron Mountains to the south, with North Conway but five miles away; the locality abounding in the most varied and delightful views of pastoral scenery. Its accommodation was soon found inadequate to constantly-increasing demands, and General Wentworth, the owner, determined upon the enlargements here shown, by the erection of Arden Cottage, followed by Wentworth Hall, Thornycroft and Glenthorne, in the order named. In grouping the buildings especial attention has been given to a nice adjustment of form and color to the surrounding landscape, and by linking the separate buildings together by covered verandas, a practical purpose is served and an effect of unity is obtained, admirably in accord with the picturesque surroundings. But little change has been made in the original grades. Approaching the building by wide drives one enters a spacious hall finished in oak, with heavy wainscot and panelled ceiling. This room has a fine large fireplace. Opening from the hall are the parlors finished in white and gold, of delicate modelling. On the other side of the hall are the billiard, reading and dancing rooms. The dining-room will seat three hundred and fifty guests, and with kitchens, etc., occupies a building by itself to the west of the hall. It is finished in mahogany, with a high wainscot and open-timber ceiling, richly moulded; the west end of the room being occupied by a huge brick fireplace of the olden time with andirons and swinging crane. The decoration throughout has been carefully studied with an endeavor to obtain subdued yet rich results. As in most hotels, the aggregation of so many people advanced into special prominence the matter of sanitation, and the successful completion of a thorough system of drainage and a pure water-supply was much facilitated by the natural advantages of an admirably located site.

HOUSE OF WILLIAM H. BLYMYER, ESQ., BEECHER STREET, WALNUT HILLS, CINCINNATI. MESSRS. DES JARDINS & HAYWARD, ARCHITECTS, CINCINNATI, O.

THIS house is built of local blue limestone, laid in broken ashlar, with finish of Ohio freestone and Indiana limestone; cornices of copper and roof covered with New York red slate; cost, about $30,000. It will be ready for occupancy about Christmas.

AN IDLE HOUR'S SUGGESTION. MR. HENRY A. NESBET, ARCHITECT, DENVER, COL.

DOUBLE COTTAGE FOR GARDENER AND COACHMAN. MR. T. P. CHANDLER, JR., ARCHITECT, PHILADELPHIA, PA.

THE APOSTLES' CHURCH, COLOGNE.

THE view selected is the well-known one showing the apse of the Apostles' Church, which was built during the best period of the German Romanesque.

THE CATHEDRAL, WORMS, GERMANY.

THIS is one of the peculiar, double-ended German churches which are so bewildering when one gets inside, since it is difficult to know which is the true choir end of the building. Another peculiarity is that the apse at one end is circular on the inside, while it is square without. The building is singularly uncorrupted by restorations, and is a fine example of the best German Romanesque. The important features of the building, which dates from the eleventh century, are shown in the view.

THE DICTIONARY OF THE FRENCH ACADEMY. — The dictionary of the French Academy, upon which that august body expends its most serious energies, has been of slow growth — a matter of two centuries, in fact. It first appeared in 1694 in two volumes, folio. Frequent revisions have taken place, the earliest of which was begun in 1700, and published in 1718; the seventh and latest is now in progress, the first number having seen the light in 1858.

THE WESTERN ASSOCIATION OF ARCHITECTS.[1]

REPORT OF THE COMMITTEE ON STATUTORY LAWS. — II.



The Old Hall, Whitchurch, Wales. from sketch by E. J. May, Arch't.

THERE are many other subjects within the province of our profession with reference to which legislative action has been asked for by its members and by the public. Among these are the responsibilities of architects to their clients and to the public; the determination of the claims of the architect upon his client for the various kinds of service rendered; the question of ownership of drawings; the relations of architects, clients and contractors to each other; the legal establishment of a scale for architect's fees; the extent and scope of lien laws and their justice and advisability; the regulation of many questions in the law of contracts, and so on, indefinitely.

We should approach the consideration of these questions with a full realization of that identity of interests of architects and public, and of the danger of hasty and ill-considered legislation before alluded to in this report, nor should we forget that the common law offers ample opportunities for the enforcement of every just claim, and for the reparation of most wrongs. It should be remembered that miscarriages of justice are most apt to occur where special legislation gives opportunities for technical objections, and where conflicting judicial opinions upon the constitutionality of statutes prolong legal contests and weary the seekers for their rights into abandonment of their just claims. Fortunately, our statute books are as yet unencumbered with legislation upon most of the subjects mentioned above. And the many failures to secure in the higher courts judicial sanction of the multitude of lien laws devised for the protection of certain special interests, warn us to proceed slowly and with extreme caution in recommending legislative action, and perhaps to avoid the same entirely whenever we can see a possibility of gaining by mutual agreement or even by appeal to the common law those ends, the attainment of which is sought by projects for the enactments of new statutes.

Let us now consider the different subjects before enumerated, and endeavor to determine in each case whether our end cannot be better attained by an extension of our knowledge and a clarifying of our ideas, than by an appeal to our State legislatures, and when such appeal is found advisable, let us ask only for what is most essential.

The responsibility of the architect to his client and to the public is one which should not be evaded, as upon this responsibility rest all his claims for recognition and compensation. It seems desirable, however, that this responsibility be properly defined and limited. A statute in force in the State of Illinois for several years, makes the architect of a building jointly responsible with owner and contractors for injuries caused tenants by defects and imperfections in the sanitary arrangement of buildings. This liability and many others exist under the common law, and nothing would be gained or lost by repeal of this statute or of other similar ones enacted in other States, but the extent of the financial liability of the architect should be definitely determined and limited to the extent of his pecuniary interest in the building, namely, the amount of compensation he is to receive for his services in connection with the same, and confined to matters clearly within the architect's control. But if these limitations were made by legal enactment, the matter would hardly be definitely settled until the constitutionality of such statute had been determined by the Supreme Courts of each State, and no statute would cover cases where the architect is accused of gross neglect of duty, or of criminal carelessness. Why not, therefore, at once leave the settlement of this matter to a test case, which could be carried up to the Supreme Court of one or more States perhaps at the expense of this Association, or at the expense of the various State associations.

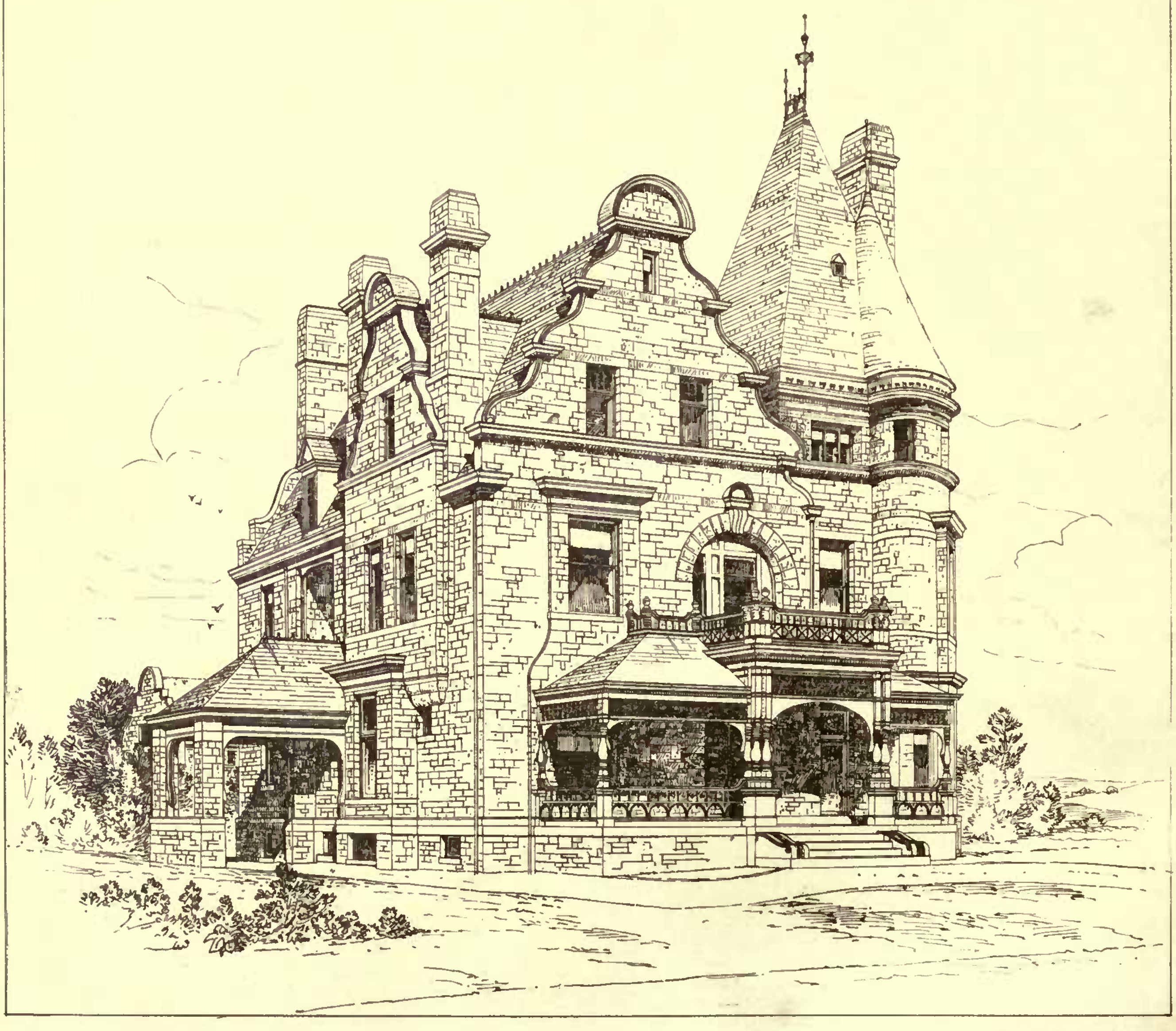
But whether we seek to solve this problem by legislation or by litigation, these efforts should apply only to that, as yet, vague and indefinite responsibility to the public at large, and to possible occupants of buildings, which cannot be made a matter of contract or agreement between architect and client. The responsibility of architect to owner can be defined, and limited and settled by positive agreement before the architect enters upon the discharge of his duties. We recommend that for this purpose a written agreement be in all cases entered into, and that this contain a full exposition of the services which the architect is to render, and of the responsibilities he is to assume. Such contracts would forestall and prevent possible disagreements and litigation.

Next in order comes the vexatious problem of paying for plans not used. It is entirely our fault if this is a vexatious problem, and to invoke the aid of special legislation is the height of folly. The lawyer who makes preparations for a suit which his client does not permit to go to court, or the care of which he transfers to another lawyer, collects compensation for the services rendered. The physician who prescribes a medicine which his patient concludes not to take, the tailor who has made a coat which the customer refuses to take, after having given his order, all know how to enforce their just claims

[1] Continued from page 274, No. 519.

RESIDENCE OF
W. H. BLYMYER Esq
BEECHER STREET,
WALNUT HILLS,
CINCINNATI, O.

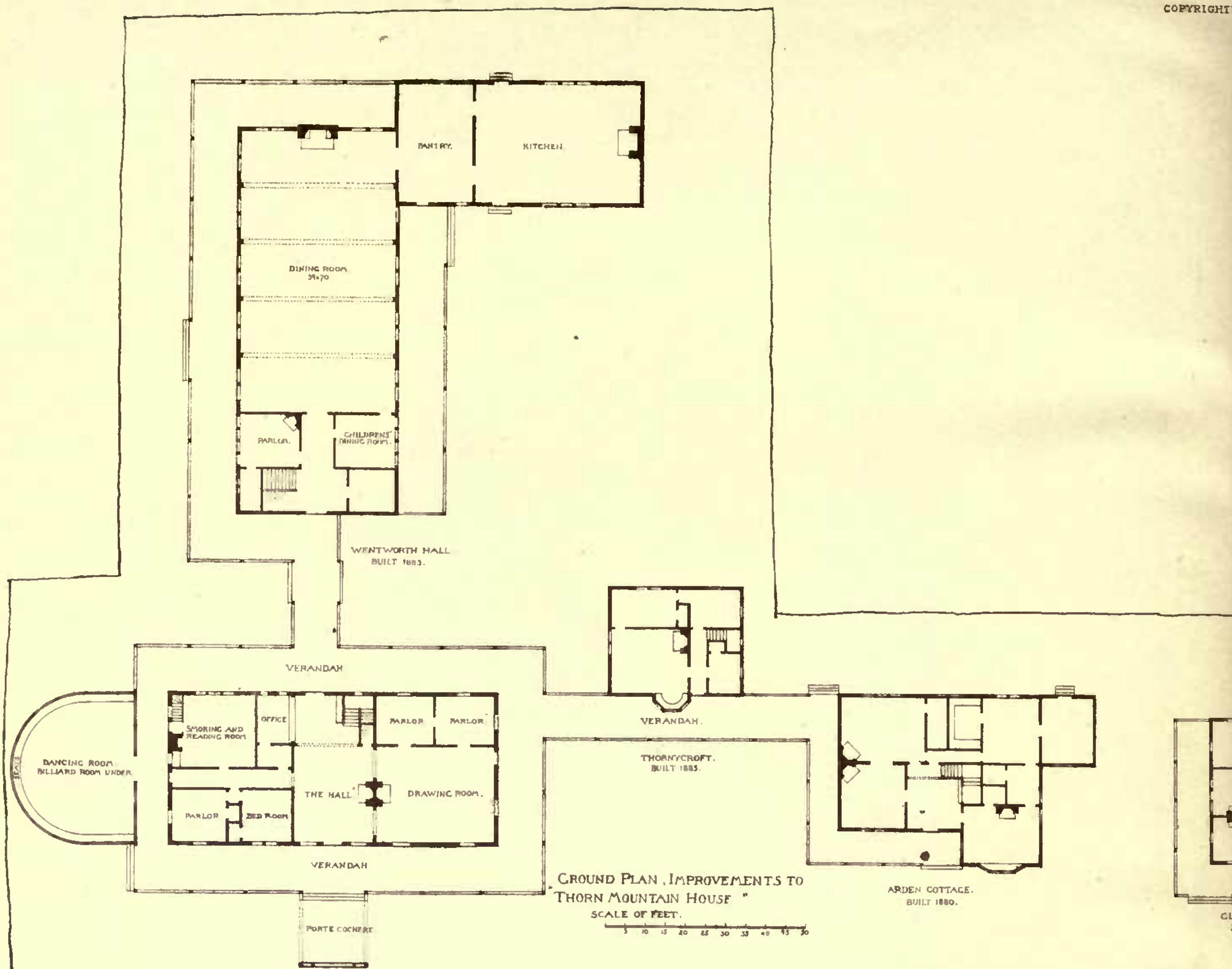
Des Jardins & Hayward
ARCHITECTS
ROOM 62 PIKE'S BUILDING

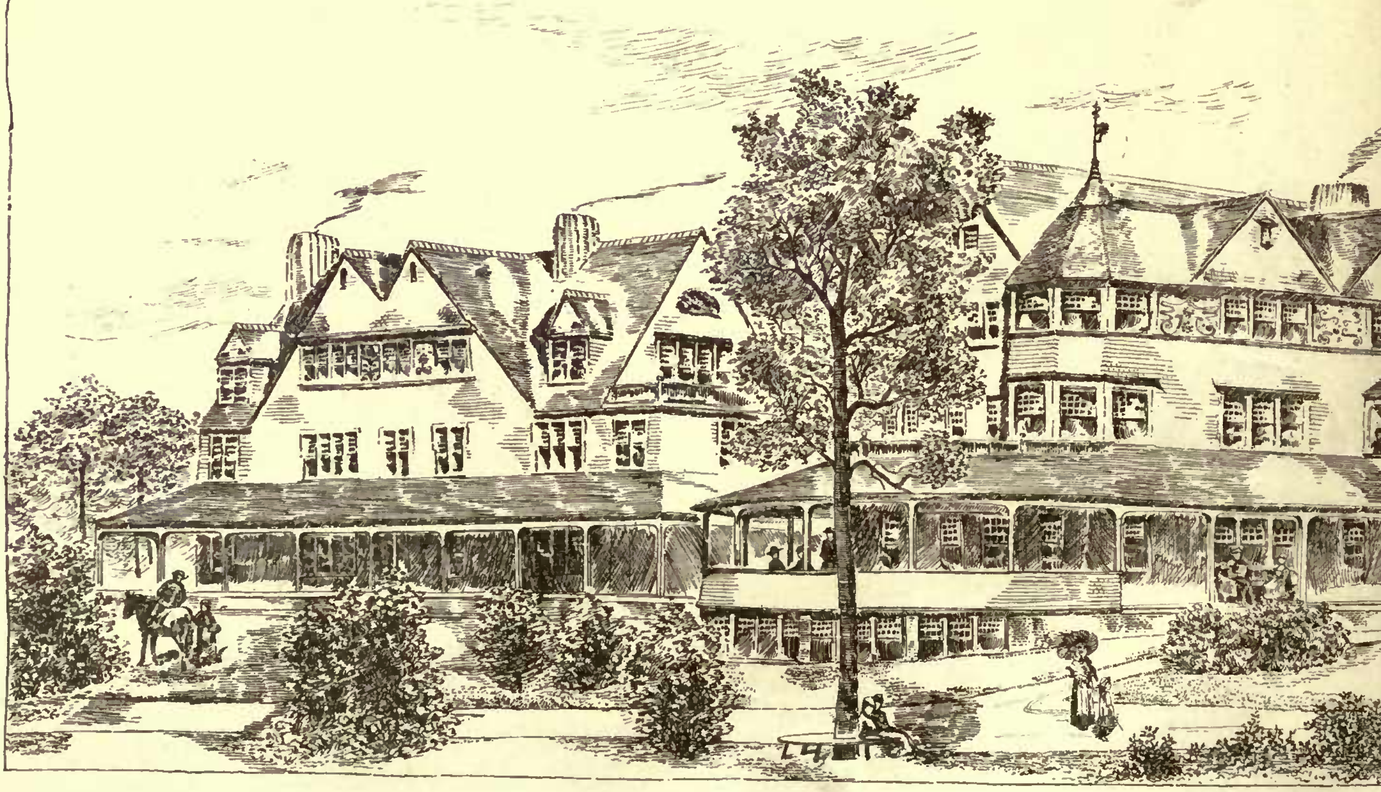


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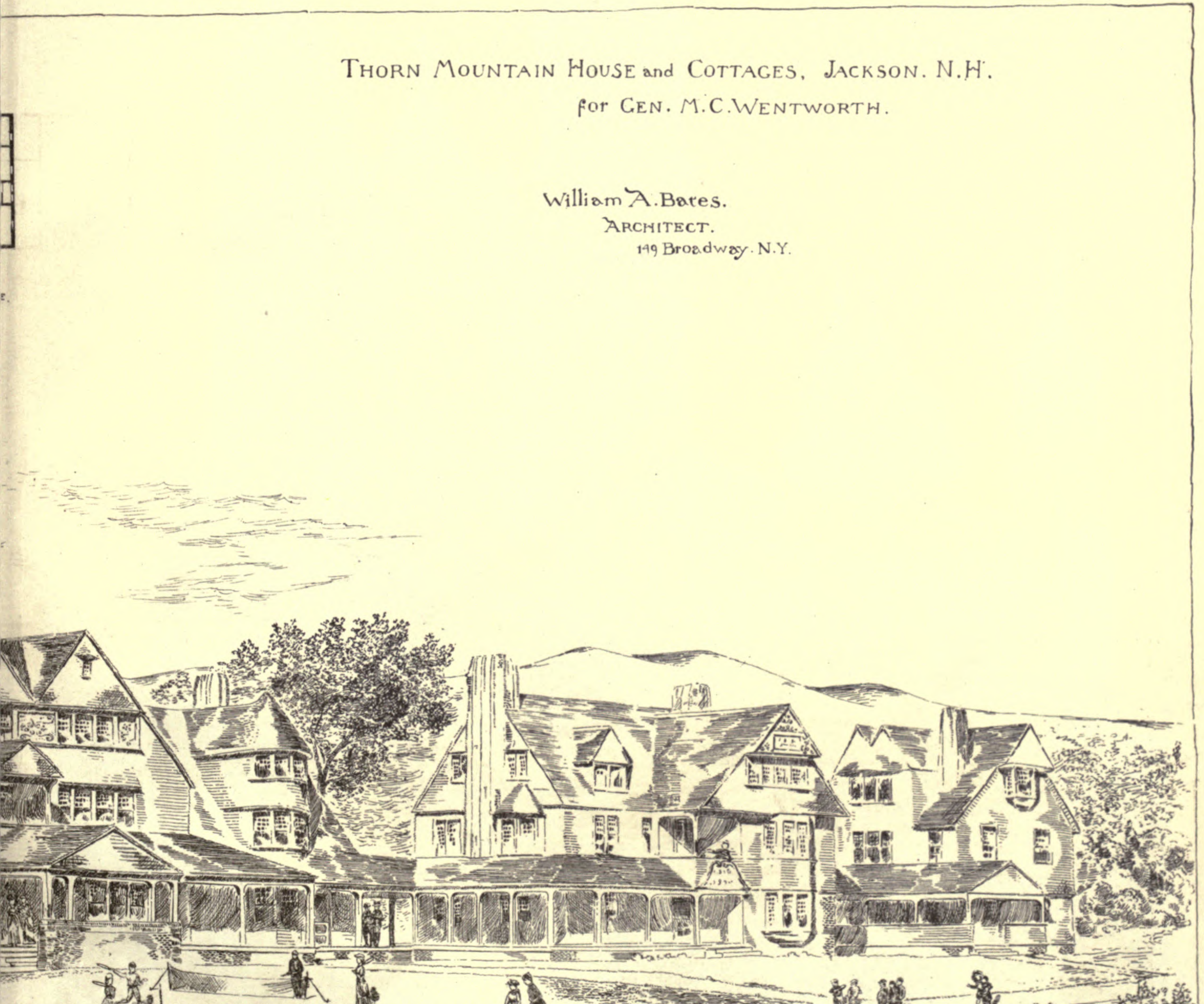


The Apostles' Church, Cologne.


PANTRY.
KITCHEN.
DINING ROOM 39x70
PARLOR.
CHILDRENS' DINING ROOM.
WENTWORTH HALL BUILT 1883.
VERANDAH
SMOKING AND READING ROOM
OFFICE
PARLOR
PARLOR
THE HALL
DRAWING ROOM.
PARLOR
BED ROOM
DANCING ROOM BILLIARD ROOM UNDER
VERANDAH
PORTE COCHERE
VERANDAH.
THORNYCROFT. BUILT 1885.
ARDEN COTTAGE. BUILT 1880.
GROUND PLAN, IMPROVEMENTS TO "THORN MOUNTAIN HOUSE"
SCALE OF FEET.
5 10 15 20 25 30 35 40 45 50



Building News, Dec. 12 1885
AMES R. OSGOOD & CO

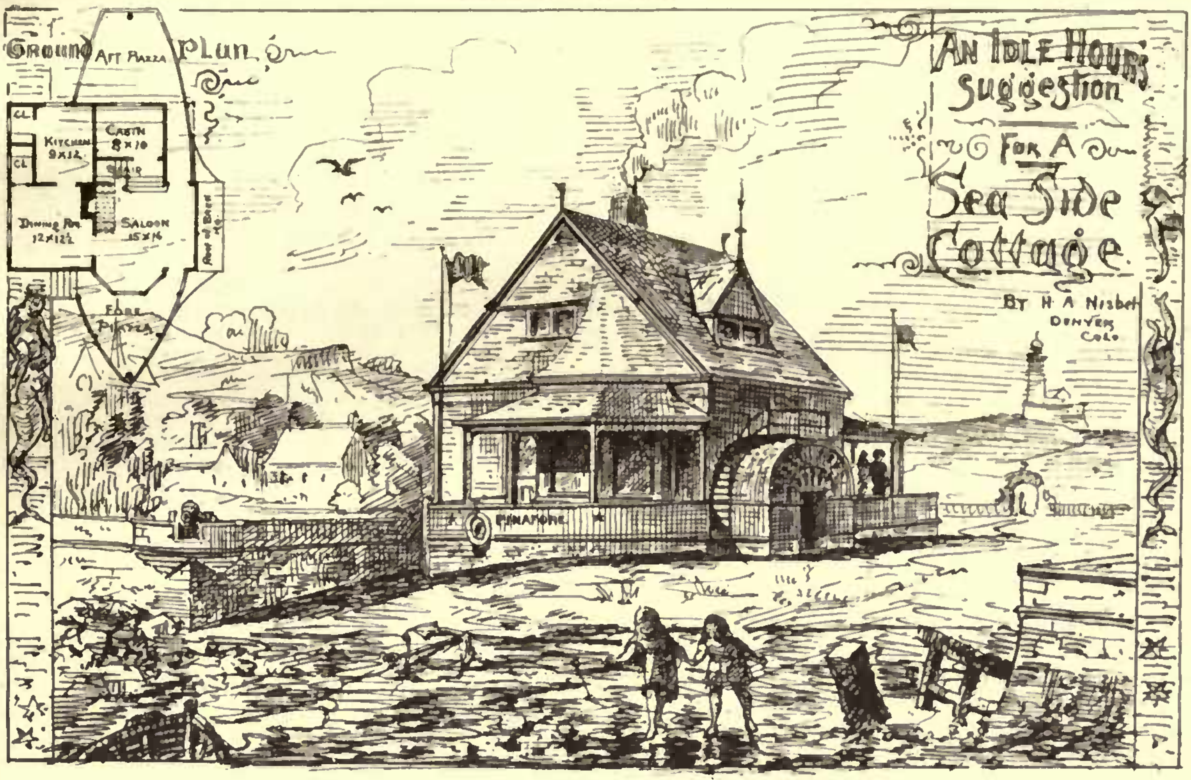


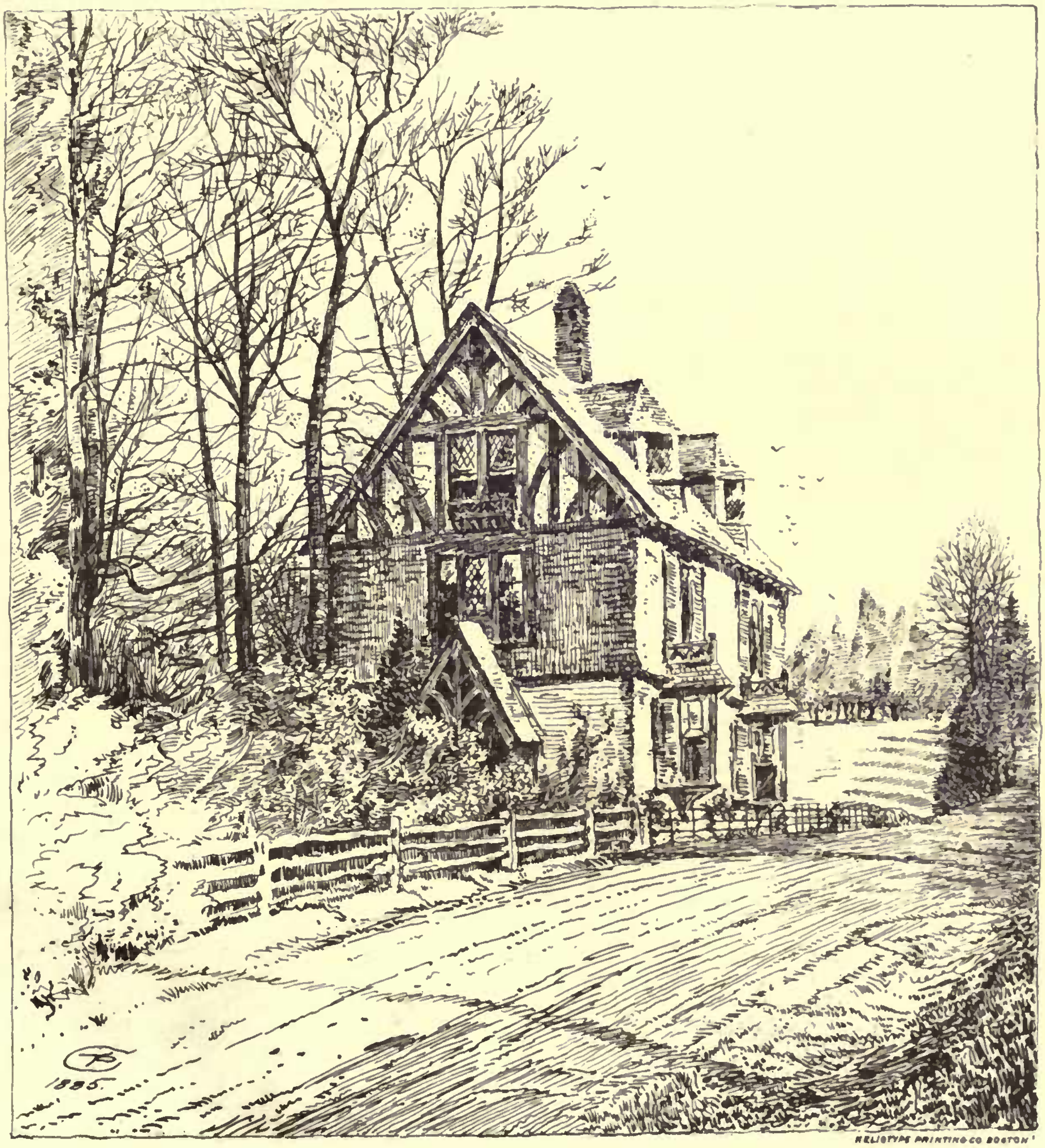
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AMERICAN ARCHITECT AND BUILDING NEWS, DEC. 12 1885 No. 520





Double Cottage for Gardener and Coachman, Germantown Pa.
Theophilus P. Chandler, Jr. Architect.
307 Walnut St. Phila. Pa.

under the protection of the common law, and of their own *esprit de corps*, something which, as yet, is lacking in our profession, and which it is the duty of our Association to call into being and to foster.

But neither common law nor special legislation will aid us so long as it is possible to rebut a claim for compensation for plans not used by the well-founded assertion that many architects are in the habit of proffering their services for the preparation of plans upon approval, not to be paid for unless used. The fault, therefore, is in ourselves, not in our laws. Let us endeavor to so shape our course as individuals that no act of ours will conflict with the interests of our profession, and the difficulties which we now encounter to a greater extent than those who follow other pursuits will vanish, and the obligation to pay one's architect will become as much a matter of course as is the obligation to pay one's lawyer or butcher or baker.

The foregoing applies to regulation of our charges for services of every kind, whether for work executed, or for work abandoned. There is no statute to fix a minimum or a maximum compensation for the various services rendered by lawyer, doctor or tradesmen; yet by the aid of the *esprit de corps* existing in the various professions and in the trades, no difficulty is encountered in fixing the value of the services of these when it becomes necessary to invoke the aid of the courts to enforce the payment of disputed claims. To ask for special and exceptional legislation in our behalf would be a confession of weakness. But to exert influence which is to be beneficial to ourselves and to others we must be strong; we cannot be strong, and certainly we will never be believed strong, if we issue a proclamation of weakness.

Closely allied to the foregoing is the question of ownership of plans. This is a matter which has been brought into court many times and decided in various ways. It can be made a matter of agreement between architect and client that the latter pays only for the use of the plans, that this use is to be once only, and that the plans revert to the architect upon completion of the building. If the client insists upon obtaining positive ownership of the plans, the architect is at liberty to refuse this demand or to accede only upon special conditions, such as increased compensation or agreement not to permit the use of the plans for the erection of other buildings. Concerted action can and will settle for us the question of ownership of plans without legislation, and it is easy to imagine many complications of this problem that would not be reached by legislation. Now, after having given our reasons for not recommending legislative action with reference to the before-mentioned subjects, we deem it our duty to offer a scheme for the removal of the difficulties enumerated. We submit as part of our report the draft of a form of contract between architects and clients, the adoption of which we recommend to the members of this Association in the belief that by its use many vexatious questions and problems will be disposed of.

To —— —— 188

For a compensation of ——— propose to furnish preliminary sketches, complete working-drawings and specifications and general superintendence of building operations, and also to audit and make settlements of all accounts for a —— to be erected for —— on ——

Terms of payments to be as follows: —

One-third when the general contracts are let.

One-third —— The balance upon the completion of the building and the settlement of all contracts.

In all transactions between yourself and contractors, —— to act as your agents and —— duties and liabilities in this connection are to be those of an agent only.

— guarantee the correctness of — drawings and accounts, and — calculations of strength of material and stability of structure, but — pecuniary liability in connection with this building is not to exceed in its total, the gross amount of — compensation.

A representative of — office will make visits to the building for the purpose of general superintendence, of such frequency and duration as in — judgment will suffice or may be necessary to fully instruct contractors, pass upon the merits of material and workmanship, and maintain an effective working organization of the several contractors engaged upon the structure.

— will keep upon — books a full and complete record of all matters connected with this building, and ledger accounts of all contracts and payments.

The amount of — compensation is to be reckoned upon the total cost of the building, including all stationary and detachable fixtures, and no rebate will be made from this amount on account of any material or labor purchased, or contracts made by you individually.

Drawings and specifications are instruments of service, and as such, are to remain — property, and are not to be used by you for the erection of other buildings than —— above mentioned.

Approved and accepted, ——— 188 ——— Architect.
——— Proprietor.

Of vast importance to ourselves and to the building public are the mechanics' lien laws, of which nearly every State has at least one, and sometimes the remains of many, all stranded and partially or wholly wrecked upon the reef of unconstitutionality. A lien law, as we understand it, creates a class of privileged creditors. This according of greater privileges to one creditor than are enjoyed by another is almost invariably unjust and often impolitic, and makes it difficult for these laws to pass through the ordeal of appeal to the highest judicial tribunals. The privileges granted by them are so anomalous, and so foreign to the general principle of the equality of all before the law, that they should be only accorded to those unable to secure justice without such assistance, or for the furtherance of important public interests.

Merchants, manufacturers, and most professional men, who sell good or services upon credit, institute most careful and thorough inquiries as to the financial standing, the business capacity and the reputation for honesty and trustworthiness of the applicants for credit, and keep a close watch upon the business and other transactions of their debtors, so as to be ready at any and all times to invoke the aid of the common law to protect them when they fear their rights are jeopardized. And it is their general experience that their rights are safest in those States whose statute books are least encumbered by special legislation upon the relations of debtor and creditor.

There is no reason why architects should not exercise the same care in the selection of their clients, as do merchants in the selection of credit customers. It is not at all an unusual thing for a mercantile house to refuse to sell goods to undesirable customers. If architects are less discriminating in accepting orders from clients, it is absurd to ask for a statute protecting them from the effect of their own want of business prudence.

It appears, therefore, that the business necessities of architects or contractors, or material-men, are not a justification for invoking the special protection granted by lien laws. It remains to be seen whether, as a measure of public policy, there is a necessity or a justification for the existence of a mechanics' lien law.

It is one of the peculiarities of our complex modern social system, that it often becomes the duty of the individual to yield some of his natural rights to the welfare of the community at large, and so great are the disparities of knowledge, wealth and power of its many constituents, that special provision must often be made for the protection of the weak against the encroachments of the powerful and unscrupulous, and it sometimes becomes expedient that the community as a whole exert its powers for the protection of certain interests, the fostering of which is believed essential to the public weal.

The justification for the existence of mechanics' lien laws is found in the above-mentioned consideration.

It cannot be denied that certainty in harvesting the fruits of his toil should be secured to the wage-worker by the community, the welfare and peace of which are so largely dependent upon the industry, thrift and contentment of its humbler toilers. There are many who are dependent upon each day's toil for the next day's subsistence and maintenance for themselves and family, and who may not know to-day whether or where they will be permitted to toil for this subsistence to-morrow. They cannot each keep a credit man to inform them whether their would-be employer is honest or solvent. They cannot before selling their services, look up the registers of the mercantile agencies for information to guide their actions. They must act promptly and go to work, or to-morrow they will starve.

It is the duty of the community by the aid of its law to insure to these, its less fortunate but not less valuable citizens, as great an immunity from danger of loss of each day's earnings as the wisdom and ingenuity of its law-makers and their advisers can devise. Such a measure of pure and abstract justice, this enforcement of the obligation of the strong community to its weakest members, should be the chief function of the ideal mechanics' lien law.

Let us now see whether a justification for further extension of the functions of the mechanics' lien law can be found in a plea of expediency and public interest.

The borrower, whose security to the lender is of unimpeachable character, is accorded more favorable terms than the one whose securities are less valuable. This rule holds good through all business transactions involving the element of credit. The preventive and protective systems organized and maintained by our mercantile and manufacturing interests, for the regulation of their credit transactions, are quite sufficient as preventives of and protections against excessive losses from reckless or dishonest debtors. But the consumers finally pay the entire cost of our system of mercantile agencies, and make good to the merchants and manufacturers their loss from bad debts and the cost of their efforts to collect them.

If the building contractor is given an enforceable lien law, a greater security from loss than that enjoyed by his fellow business men, the law of competition in trade will soon place him, with regard to the margin of profit expected from his operations, nearer to the lender on mortgage security than to the merchant whose safety lies in his ability to diagnose correctly the degree of rectitude and business capacity of his debtors, and whose profits must therefore be large enough to cover an element of risk, which by the operations of a protective lien law would be eliminated from the operations of a building contractor. Therefore, from this tendency of this special protection to reduce the cost of house building, and of house occupying, and thus benefiting the entire community, we can deduce a strong argument for including the contractor and material-man and perhaps the architect, among those included in the protection of the lien law.

But as many of the lien laws heretofore enacted have contained provisions in the highest degree unjust, and as no real or permanent good can accrue to any part of the community from protective measures that work injustice to others, it behooves us to exercise the greatest care in our treatment of the subject.

First of all, the nature and extent of the lien claims should be clearly and definitely determined and limited, and, for the protection of all parties, they should be made matters of record, the same as mortgages.

Solvent employers of labor pay their hands every week or every two weeks, and the regulation of the possible lien claims of the laborers should be based upon this practice. The laborer who has worked

two weeks at any building without payment shall be required, if he desires to avail himself of the protection of lien laws, to notify the owner of the building, or his architect or other properly accredited agent, of the default in payment, and such notice made in writing or before two disinterested witnesses shall make it obligatory upon the owner of the building to see to the discharge of the contractor's obligations towards the employés making such notice, and if, within a week from the date of such notice, he fails to secure the settlement of a just claim of an employé upon his building, such employé shall, to further secure his rights under the lien law, file notice of the same with the proper recording officer of the county in which the work has been done, and this record shall be and continue the evidence of a lien against the building and the property upon which it is erected, until the justice of the claim shall have been determined by mutual agreement or judicial decision and the amount found just shall have been liquidated.

No claim of any employé shall be allowed to become a lien unless notice has been filed upon the owner and in the court within the time before stated.

It is intended by this provision to prevent, as far as possible, the practice of dishonest contractors collecting payments and neglecting to pay their employés, and to prevent employés from indirectly aiding and abetting this practice of contractors by continuing to work without enforcing payment of their wages in the assurance that, no matter how long they may work without pay from their immediate employer, nor how large their claim against their employer may be permitted to grow, they will be safe and their payment secure under the operations of a lien law.

Contracts and sub-contracts to become liens should be filed for record with the proper recording officer in the county in which they are to be executed; if not so recorded they will be in the same category with loans unsecured by mortgage or goods sold on open account.

Throughout this act we wish to enforce the principle that when special protection is given any class of creditors, prompt and immediate publication of the existence of their specially protected claims should be given to all others who may be already or who may still become financially interested in the property against which their claims may become liens. By this course the rights of laborers, material-men, contractors, architects, and owners of buildings will be secured one against the other, positively and openly, and that element of uncertainty with which the subject of lien claims and the securities under them or against them is now invested will become eliminated, and the nature and extent of possible lien claims against the building in course of erection will be as easily ascertained by reference to the public records as are mortgage, judgment or tax claims.

If, through our organization, we succeed in formulating a lien law based upon these principles, and so shape it as to avoid the conflicts with State constitutions and natural rights which have crept into so many of the former efforts in this direction, we shall have accomplished a work that will warrant us in making the greatest sacrifices in behalf of our organization.

But to succeed in this most difficult undertaking will require most arduous labors in collecting legal opinions from eminent authorities as to the reasons for the failure of so many attempts toward the enactment of similar laws, and as to the features in former lien laws that have been found practical and beneficial in their operations. It will also be desirable that conferences be had with legal representatives of real estate and building interests, contractors, and with representatives of the various trade and labor organizations.

There are many other subjects relating to existing or perhaps desirable laws and ordinances of direct interest to the building community, with reference to which your Committee might have made investigations and report. It is our belief, however, that the matters selected for your consideration at this Convention are the ones of gravest importance, and that to do them justice will take up a sufficient amount of the time at the disposal of your Convention.

We would state to the Convention that we have made an effort to gather reports of legal enactments and legal decisions upon many points of interest. We found, however, so many contradictions and conflicts of opinions in decisions upon apparently similar or identical questions, that so often the decisions of the courts were really based upon technicalities or side issues brought up by counsel more desirous to win their cases than to settle abstract principles of law and justice, that we despaired of our ability to present them in sufficiently intelligible form, and that we determined not to embody these as yet undigested researches in our report. We do, however, recommend that it be hereafter made the duty of your Committee on Building Laws to make and keep a record of building legislation in general as it now exists, and to continue this record with reference to future building legislation; that it gather reports of judicial decisions upon all matters relating to building interests; that it compile these with special reference to the extent by which important principles are settled and determined; that it place itself in communication with the various State organizations, or in States where these do not exist, with two members appointed by this Association for the purpose of tendering its advice in all cases, and assistance in all cases where efforts are being made for the passage of State or municipal legislation governing or affecting building interests. And finally, when litigation is being carried on in which important principles are at stake, they endeavor, if necessary, by furnishing the assistance of eminent counsel and means for carrying such cases to the higher courts, to arrive at definite and final decisions of all principles of law affecting our interests.

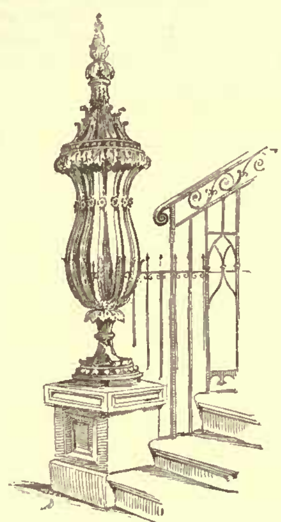
We know that the carrying out of this policy will involve an outlay for attorneys' fees, clerk-hire, etc., far greater than the present means of our Association will warrant, but it appears to us that the measures recommended will be of so great prospective value to each of us individually that we should all be willing to increase our contributions to the funds of the Association sufficiently to make it a body whose beneficence and powerful influence will be felt throughout the land.

D. ADLER, Illinois, *Chairman.*	J. S. MATHEWS, Wyoming.
I. HODJESON, Minnesota.	S. I. OSGOOD, Michigan.
E. O. FALLIS, Ohio.	ALBERT E. COBBE, Dakota.
C. K. RAMSAY, Missouri.	C. A. CURTIN, Kentucky.
C. H. LEE, Iowa.	E. TOWNSEND MIX, Wisconsin.
JAS. F. ALEXANDER, Indiana.	SIDNEY SMITH, Ohio.

Committee on Statutory Laws.

BENDING CAST-IRON.

WE trust that the *Scientific American* will pardon our reproducing at length the following interesting information: —


Old Wrought-Iron Newels Albany, N.Y.

The quality of cast-iron in softness — yielding to tool-working — and in toughness has been greatly improved within the memory of many workers who are not old men. The crisp, brittle, hard character of cast-iron has been changed to a material of a purer condition and therefore better nature.

One of the peculiarities of modern cast-iron for machinery purposes is its flexibility, its capacity of being moved from its moulded position and retaining its new contour. In the older time it was necessary to peen a casting in order to permanently bend it, and this peening was rarely more than skin deep. The action of peening is simply to expand the surface of the casting by the quick, sharp blows of the peen end of the machinist's hammer — the unattached parts must, perforce, give to this persuasion. The consequence is that the hammered side is stretched, just as hammering will stretch lead, or silver, or copper, or any malleable metal. But the objection to the peening process is that the after-working by the file or the planing tool may destroy all the work done by the peen end of the hammer.

But it is possible to permanently bend cast-iron without resort to such heroic methods as peening, and the ruder one of heating to redness in a forge fire, bending while soft, and plunging into cold water; the last so risky of breaking the casting that it is seldom tried, except on cheap stuff like grate-bars or similar traps. Good cast-iron can be bent and keep its bend, without the slow process of peening or the risky one of bending under intense heat and chilling in cold water with the chance of breaking. And this quality is sometimes handy.

In a cotton mill for spinning peculiar yarn, the leaders on a spooler require to have a decided curvature near their heads. For convenience in finishing and fitting, and for economy in production, castings were preferable to forgings. These castings were made flat; but after being finished, they were heated over a blaze and bent under a lever. The amount of bend was more than 30°.

A casting was made recently which required two turns or bends in its length, the casting weighing something over three hundred pounds. The superintendent determined to make the casting straight, plane and finish it, and afterward bend it to shape. This was successfully accomplished. The curved pattern would have been costly, the resultant casting might have been faulty, and the hand dressing and finishing of the double-curved casting would have made the piece cost more than if forged. But a forged piece of wrought-iron was just what was not wanted; it was a casting, and it was made.

Where the bends were to be made were stationed alcohol lamps, the piece being suspended between proper supports. After the under side being heated to a degree that would have drawn hardened steel to a straw color — as a supposable degree of heat — a pressure, by a weighted lever, was introduced on the upper side of the casting. As the lamp was moved from point to point, it was surprising to see how the iron yielded to the pressure and the heat. A curve was made that could not have been finished by planing, and yet the bent casting retained its finish, only the discoloring by the lamps being necessary to be removed by emery-cloth rubbing.

A crooked casting, withdrawn out of line by injudicious pattern-making and lack of sensible moulding in the foundry, was about to be thrown on to the scrap heap, at a loss of nearly a hundred dollars. It was straightened to usefulness simply by the careful use of two gas flames diffused by wire netting, and by the use of weight. It is quite possible to bend or to straighten cast-iron to an appreciable

extent by a quite low degree of heat, if the heat is judiciously applied; a gradual heating of the side to be elongated by a heat that can be controlled, and the simultaneous persuasion of weight, lever, or screw, will do wonders on such a material as the cast-iron, that is usually considered to be of too friable, untenacious and brittle a nature to be much beyond stone in resistance to tension; but even stone will bend.

COMPLICATIONS ARISING FROM THE BURNING OF DRAWINGS.

CHEYENNE, WYO., November 7, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I will regard it as a very great favor, if you will advise me as to my rights in the following case; and also, if you can refer me to adjudicated cases involving the same or similar questions.

In August, 1883, I was employed to get up plans for a block of seven stores to be built here by Messrs. C. & A. It was understood at the time that they did not intend to build until the following spring. And to prove this statement, I can produce a card published by C. & A. in the local papers, saying in effect, "That, although they were having plans prepared, they would not improve that locality until certain objectionable parties vacated that neighborhood." (The cause of their animus being a low-class, colored saloon, on the opposite corner from where they proposed to build, and which by-the-bye, they have not yet succeeded in obtaining possession of, or in ousting the objectionable parties. I state this because C. & A. have made the assertion that the reason they did not build in '83 was on account of my delay in completing the plans; which I most emphatically deny!)

The plans were fully completed — general drawings, specifications and details — that fall, C. & A. were aware of that fact, but they left them in my possession (without any agreement, however, except that it was tacitly understood that they did not intend to use them till spring) all winter and until the 25th of March, when they were destroyed by a fire which consumed my office and its contents. At this time I had received nothing from C. & A. for making the plans. I had never rendered my bill, or asked them for anything on account. So, when the plans were totally ruined, I thought, perhaps, that the easiest way to prevent complaint and trouble would be for me to reproduce the drawings at my own expense.

I told C. & A. "that, although I considered them legally liable for the set destroyed, to show that I was willing to do what was fair, that I would make them over again." Mr. A. told me "to hold on for a few days, for they had sold part of the lot, and of course, that would necessitate changes in the plans, but that they would let me know what they wanted in a few days." As it was as easy for me to make the changes desired, as to make them the same as the first set, I consented. But they never came to tell me just what they did want; when approached upon the subject, they always said "We will be up in a few days, and fix it up." Failing to do so, I finally became impatient, and sent them a note asking for definite information in regard to changes desired? In about ten days I received a reply, saying, "Don't do anything to plans, *until ordered to do so.*" I answered, "that I had not applied to them for *orders* to go on with the plans, but to ascertain their views in regard to the changes they said they wanted. As they had failed to enlighten me, and as it was not necessary to order the same set of plans from the same party twice, and they did not deny ordering them *once* (in their letter they admitted this), that I should proceed to make another set, as I had promised to do so, the same as originally ordered." And I did actually begin work on the second set, when I was advised that I was only putting myself to unnecessary expense, and that I would then possess no more rights than I did at present.

Since then I have sent them a bill for $1,050 (three-and-a-half per cent on $30,000, the estimated cost), but they have paid no attention to it.

I have sought legal advice, and they seem to think that the pivotal point of the case will be: Was I negligent in not making them a formal tender of the plans when finished?

I claim, that they knew they were finished months before the fire, and that if they chose to leave them in my possession, that they did so at their own risk.

Now, if you can refer me to any decisions bearing upon the case, or if you will kindly give me your own opinion of its merits, I will be very thankful to you.

Of course, I can see now where I should have acted otherwise than I did in several particulars, but have my acts vitiated my rights in the premises? Yours respectfully, J. S. MATTHEWS.

[THE cases of Tolman *vs.* Phelps, and Phelps *vs.* Tolman, District of Columbia Reports, and noted in *American Architect*, No. 394, throw some light on these questions, although they are not sufficiently similar to this to be a very safe guide. The fact of the contract for professional service seems here to be admitted. Under ordinary circumstances it is probable that a delivery or tender of the plans and specifications would be held necessary to the completion of the contract on the part of the architect, courts generally taking the absurd position that an architect can only fulfil his professional duty by depriving himself, after he gets half through his service, of the means of completing it. In the present instance, however, C. and A. seem to have waived delivery, not only through the universal custom which leaves plans and specifications in the custody of the architect until demanded by the client, but by their repeated expressions of intention to postpone building. The plans, not having been formally tendered or claimed, were stored at the risk of the architect, instead of at the risk of the client, as they would have been, we think, if the architect had tendered them, and had been asked to keep them. Having been destroyed while in his possession, he is bound to replace them, and on doing so, with such promptness as to cause no damage to the interests of his client, his duty is fulfilled, so far as it is possible for him to carry his services before the execution of the plans is begun, and he stands in the same position that he did before the fire.

As it seems to us, the incident of the fire does not affect the contract at all. The architect is engaged to do certain work for his client, and, in order to get paid for it, he must do it and deliver it, or offer it to his client, fire or no fire. On the other hand, his client having ordered the work, must take it and pay for it, whether he changes his mind about using it or not, unless he can show that the architect was unreasonably slow in complying with his wishes, or in some other way failed to do what was properly to be expected of him. It was a mistake on the part of our correspondent to stop work on his duplicate set of drawings. The delay which his clients' talk about alterations caused him entitles him to a reasonable extra time to do his work in, but he must do it, and either deliver the plans and specifications, or make formal tender of them before a court will award him payment for them. Even then, he must make sure that he has sent a bill for what he was engaged to do, and not for something else. If he was employed to design and superintend the stores, his duty is not complete until he has done so, and his present bill should only be on account, and he must make his willingness to go on and complete his contract perfectly clear. If his clients then, without fault on his part, refuse to let him do so, they are bound to pay him just as much as if he had superintended the work. On the other hand, if they can make it appear that they were willing to have him go on with full service, but that he broke off when he got two-thirds through, and refused to do any more, they will be absolved from the contract, and need not pay him anything; on the general principle that one party to a contract must perform or be able and willing to perform the whole of his part of the agreement, before he can compel the other party to fulfil his part.—EDS. AMERICAN ARCHITECT.]

"A QUESTION OF COMMISSION."—THE OTHER SIDE.

IOWA CITY, IOWA, November 27, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — My attention is drawn to an article published in your paper of date, November 21st, 1885, headed "A Question of Commission." From an examination of the paragraphs submitted by B, I suppose the "A" referred to must be myself, as the paragraphs submitted are identical with those prepared by me in circular form and sent to some of the leading architects of this and other states. It seems to me that B has omitted a fact and a paragraph necessary to a proper submission of the question. Paragraph third, reads as follows: "The cost of the building, when completed for occupancy, must not exceed $9,000. No plans will be considered the cost of erecting which shall exceed said sum." The actual cost of the building completed was in excess of $9,000, excluding furnaces. When B submitted his plans to A, he submitted also an estimate of the cost of the building not including furnaces; the estimate of the cost being, with the commission, $214.10, included $8,564.25.

I enclose you herewith one of the circulars. Please state with these additional facts before you, whether B is entitled to commission on the cost of the furnaces? Very truly, A.

[WE do not think that B. stated his case unfairly, nor do we think that the fact that the building actually cost more than the stipulated sum material to the question—it is a bad habit new buildings will fall into. But we do find that B's case should be thrown out of court, from the fact that the work was awarded to him on his estimate of $8,564.25 *plus* the 2½ per cent commission on a sum which did not include the cost of a furnace. If, however, B had to modify his original plans to provide for the furnace which was selected before the working-drawings were begun, he has a reasonable claim for commission on the plea of extras — if he thinks it worth while to make such plea—EDS. AMERICAN ARCHITECT.]

JOISTS AND BEAMS.

HARTFORD, CONN., November 19, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — 1. What is the best method of protecting ends of wooden joists, white and Southern pine and spruce, in brick walls? Tarring the ends is recommended; also leaving air-space around them, but would not the latter induce dry-rot if plaster was appled direct to the walls, preventing circulation of air.

2. Why should ends of joists be bevelled (so to fall out easily in case of fire) if they are to be securely anchored into the wall?

Respectfully, SOLEIL.

[(1.) VENTILATION, if it can be arranged without weakening the walls or causing any loss of lateral stability, is the best way to prevent dry-rot. Plaster will not prevent the needed circulation. (2) To prevent pulling over the wall in their fall; for the same reason the anchors should be fixed along the under side of the beam, not along the top as used to be the practice.—EDS. AMERICAN ARCHITECT.]

POUND-FOOT *vs.* POUND-YARD.

NEW YORK, November 28, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—No manufacturer having answered the query, "Why the weight of wrought-iron is given per yard and not per foot," allow me to suggest a possible reason.

If the area of cross-section of a piece of wrought-iron is multiplied by *ten*, we have the exact weight per yard of the piece; or, if we divide by ten the weight per yard of the piece, we have the exact area of cross-section (the area to be taken in square inches and the weight in pounds).

Thus, if a rectangular piece of iron were 6″ x 8″ in cross-section, its weight per yard would be $6 \times 8 \times 10 = 480$ lbs. Now a piece of iron 6″ x 8″, and one yard long, contains $6 \times 8 \times 36 = 1728$ cubic inches = 1 cubic foot.

We know that one cubic foot of wrought-iron weighs 480 pounds, which, of course, proves the rule. Respectfully yours,

L. DECOPPET BERG.

ROUGH-CAST.

POTTSVILLE, PA., November 23, 1883.

To the Editors of the American Architect: —

Dear Sirs,—I am a constant reader of your paper, and I write to you for a recipe for what is called "rough-cast" plaster used on the exterior of houses; also, how it is colored the different shades?

As I am a new beginner, would be thankful for any information on this subject that you could give me, through your valuable paper.

At present we have not got any buildings with that plaster, and I would like to introduce it. Hoping that you will give this an answer at your earliest convenience, I am, Yours truly, W. D. H.

[The old-fashioned rough-cast was formed by a coat of lime and hair mortar applied over laths and allowed to dry. A second or smooth coat was then applied, and before it was dry there was "cast" upon it, by means of a wooden paddle, a quite fluid mixture of lime and clean, coarse sand or gravel, and either allowed to dry as it fell or was brushed to a surface with a wet, coarse brush. It was important to apply the last coat hot. Modern usage sometimes substitutes wire-lath for wood, and cement for lime. The rough-cast may be colored by any of the ochreous earths whose colors are not destroyed by the action of the lime.—Eds. American Architect.]

FURNACE CHIMNEY-SHAFTS.

MONTREAL, November 23, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Please inform me how a furnace-shaft should be constructed, and what appliances should be used, in order to avoid to the utmost extent possible the nuisance from smoke from firing steam-boilers. Thomas Cushing.

[As a chimney-shaft has to be carefully proportioned to the work it is expected to do, it is not possible to answer so general a question. We would advise your procuring the work of R. M. and F. J. Bancroft on "*Tall Chimney Construction*," an advertisement of which appears on another page, where you will find the desired information. As to preventing the smoke nuisance, perfect combustion and careful stoking are essentials. Various devices have been successfully employed for ensuring the absence of smoke both in Chicago and Cincinnati, which have and endeavor to enforce smoke-nuisance ordinances, and we would recommend your applying to some architect in either of those cities for the necessary details of construction. — Eds. American Architect.]

THE DURABILITY OF GALVANIZED IRONWORK.

KANSAS CITY, MO., December 2, 1885.

To the Editors of the American Architect: —

Dear Sirs,—Has sufficient time elapsed since galvanized-iron came into use for cornices, dormers, etc., to determine its durability as ordinarily used for such purposes?

Aside from the question of architectural fitness, I think it would interest many of your readers besides myself to learn the average duration of this material when used for the purposes above named.

"*Pro Bono Publico.*"

BOOKS ON ROOF TRUSSES.

DAYTON, O., December 2, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Will you please tell us what you regard the best practical authority on iron bridge and roof trusses, a work valuable in actual work. Respectfully yours, M.

[Humber's "*Complete Treatise on Cast and Wrought Iron Bridge Construction*," and Francis Campin's "*Iron Roofs*," together with Greene's "*Graphical Analysis*," should form useful additions to a working library. — Eds. American Architect.]

BOOKS ON MENSURATION.

To the Editors of the American Architect: —

Dear Sirs,—Where can a text-book that would assist a student in perfecting himself as a measurer be found? and also at what price?

Respectfully, Student.

[Hodgson's "*Builder's Guide and Estimator's Price-Book*," published by the Industrial Publication Company of New York, and the "*Practical Estimator*," published by David Williams of New York, are both serviceable little books, and quite inexpensive, though we will not say that their study will make you "perfect." — Eds. American Architect.]

A CORRECTION.

PHILADELPHIA, December 7, 1885.

To the Editors of the American Architect: —

Dear Sirs,— In your issue of December 5, in referring to the rood-screen on page 270, you state it was made in the shop of Louis Koenig. The rood-screen referred to was made by us, Mr. Louis Koenig being the name of the foreman in charge of the work. We regret very much this error has occurred, and trust you will notice it in your next. Yours truly, J. B. Shannon & Sons.

NOTES AND CLIPPINGS.

An Inconsequence connected with Hell Gate. — A correspondent of the Portland *Advertiser* makes the astonishing suggestion, that perhaps the United States is liable for the damage done by the recent high tide in New York, asking: "Has the opening of Hell Gate, while improving the navigation, injured the property owners in the city by allowing the easterly winds to drive Long Island Sound too easily into the harbor?"

The Glyptothek and Pinacothek Collections in Danger of Dispersal. — I learn from Munich that a profound sensation has been caused there by a sinister report that the Bavarian Cabinet meditate advising the king to sell the Glyptothek and Pinacothek, which are valued at £3,000,000. It is incredible that even a German minister could sanction so scandalous a transaction, for the contents of these galleries are no more the private property of the King than are the pictures of our National Gallery the property of the Queen. It is proposed that the King should sell the galleries to the country, the plan being, in fact, a cunning dodge to obtain an immense sum of money for the purchase of property which practically belongs to the country already. No doubt there will be sharp interference from Berlin if the project goes any further, as some time ago Prince Bismarck intervened very decisively when another German ruler meditated selling some of the gems in his gallery to an American millionaire. — *London Truth.*

Fall of Electric Light Towers in Savannah, Ga. — The high electric-light tower at the intersection of Liberty and Habersham streets fell with a tremendous crash at six o'clock November 15. The fall was caused by a runaway mule striking the tower. No one was hurt. The towers were put up about three years ago. They are anchored in a foundation of brick and cement, and were considered very strong. This tower is the third one that has fallen in Savannah. One at Huntingdon and Price streets toppled over before it was finished. About a year ago a freight car in the Central Railroad yards jumped the track and crashed against the tower by the passenger-shed, bringing it down. Two or three of the structures are one hundred and eighty-five feet high. They are ascended by an automatic elevator, which, when not in use, is kept locked a few feet above the ground. Some months ago a painter who had been coating one of the towers got out of the elevator cage before fastening it. The cage at once started for the top, gaining in speed the higher it went. When it struck the top platform the whole top was broken off. Not long ago a tower in Macon was knocked down by a mule. The towers cost about $1,200, and with the lamps the price runs up to nearly $1,300. — *Savannah News.*

The Nicaraguan Canal.— The report of Civil Engineer Menocal of the navy upon the Nicaraguan canal route recently surveyed by a party of which he was at the head, has been made public. The expedition paid an official visit to the president of Nicaragua at Managua. He extended a cordial welcome and expressed the hope that the American Congress would ratify the pending canal treaty. The proposed route extends from the harbor of Greytown on the Caribbean Sea to Brito on the Pacific. Its total length is 169.8 miles, of which 38.98 miles will be excavated canal and 130.82 miles navigation by Lake Nicaragua, the river San Juan, the basin of the river San Francisco and seven locks. The lake (or inland sea) of Nicaragua is about ninety miles long and forty wide, and will be connected with the Pacific by a canal, and with the Atlantic by slack-water navigation in the river San Juan, by a short section of canal from the river San Juan to the basin of the river San Francisco, by navigation through this basin and by a canal thence to the Caribean Sea. It is proposed that the canal shall have a depth of from twenty-eight to thirty feet, with a minimum width in rock and deep earth-cuts of eighty feet at bottom. It is estimated that a ship may pass from Greytown to Brito in thirty hours. The estimated total cost of the canal is $51,234,958. Thirty-two vessels can pass the canal in a day, or 11,680 in a year, which, at the average tonnage of vessels passing the Suez Canal, will give an annual traffic of 20,440,000 tons. This is based on the theory that the canal shall be illuminated with electric lights, and the lake and river with beacon and range lights, so that vessels can move at night as well as day. It is estimated that the canal can be completed in six years, and will cost, including a contingent of 25 per cent added, $64,043,697.— *Springfield Republican.*

Excavations at St. Mark's. — In connection with the works in progress for the repaving and relevelling the Piazza of St. Mark an undertaking has been commenced which may lead to results of considerable archæological importance and which will be of especial interest to students of the architecture of Venice. When the repaving of the piazza was determined upon the Historical Society of Venice proposed that researches on a scientific basis should be conducted with a view to discover the sites of ancient buildings which formerly stood on the site of the present piazza. The project has been agreed to by the municipality, and the work has been placed under the direction of the architect, Signor Giacomo Boni. The ground at present opened includes the foundations of Leopardi's bronze sockets for the flagstaffs. Beneath the sockets have been already found various pieces of twelfth century sculpture, some in excellent preservation and of admirable workmanship; they comprise square and circular panels and fragments of mouldings. They are probably, however, not connected with the history of the piazza, but belong to mediæval buildings demolished at the period of the early Renaissance. The especial points which it is hoped to determine will include the original area of the piazza before it was lengthened by Sebastiano Ziani *circa* 1176: to discover the section of the canal Battario, which was at the end of the ancient piazza, but which would be about the centre of the present one; buried in the mud will probably be found many objects of interest. Further, the site of the votive church of St. Giminiano, built by Narsete, A. D. 552 will be determined; here again mosaics (sixth century) and sculpture may reward the investigators. Of later date will be the foundation of the wall of fortification built by Doge Tribuno (902) to protect the Venetians against the Hungarian pirates, who in the chronicle Sagornino are called *pagana et crudelissima gens.* Here also should be found the foundation of the hospital built by Doge Orseolo (eleventh century) close to the Campanile, and the Procuratie built by Doge Ziana (Byzantine style) and which was destroyed in the sixteenth century. The works are expected to cover a period of two or three years. — *London Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents heremcntioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

331,047. COMBINED SQUARE AND MITER.—Philo L. Fox, Bridgeport, Conn.
331,053. WRENCH.—Nathan H. Griffith, Providence, R. I.
331,064. OVERFLOW FOR BATH-TUBS, SINKS, ETC. —Thomas Kennedy, Philadelphia, Pa.
331,073. LOCK. — Wilbur J. Mandeville, Rochester, N. Y.
331,077. SHOW-WINDOW VENTILATOR.—Martin G. Mock and Walter S. Maywood, Muncie, Ind.
331,081. FIRE-ESCAPE.— Horace F. Neumeyer, Macungie, Pa.
331,094. SLIDING-DOOR LOCK.—William E. Sparks, New Haven, Conn.
331,112. KNOB ATTACHMENT. — Charles H. Beebe, Norwich, Conn.
331,114. MOULD FOR BUILDING CONCRETE WALLS. —Thomas W. Carrico, San Antonio, Tex.
331,123. FIRE-ESCAPE. — John Fisher and Alexis Coquillard, South Bend, Ind.
331,130. WINDOW-BLIND. — Willis G. Hale, Philadelphia, Pa.
331,150. WINDOW-SHADE ATTACHMENT. — Elliott Metcalf, Cass City, Mich.
331,153. LOCK.—William M. Morton, Minneapolis, Minn.
331,158. WRENCH.—Edward Phillips, Cleveland, O.
331,161. PETROLEUM HEATING - APPARATUS. — Robert Schulz, Dresden, Saxony, Germany.
331,161. HAND-SCREW OR VISE-JAW ATTACHMENT. Edgar Shaw, Lynn, Mass.
331,189. RAPID - TRANSIT WRENCH. — James Du Shane, South Bend, Ind.
331,191. FIRE-ESCAPE.—John Fleming, Calais, Me.
331,195. SPLITTING - SAW. — William G. Hawley, Hanford, Cal.
331,228. EARTH - AUGER. — Wm. W. Curtis, Stanberry, Mo.
331,232. METHOD OF APPLYING WOOD VENEER.— Ann and Chas. de Bourbon d'Este Pateologus Gonzaga, 18 Elgin Road, St. Peter's Park, County of Middlesex, England.
331,243. MANUFACTURE OF CEMENT.—William Joy, Northfleet, England.
321,258. SLIDING-DOOR HANGER.—Charles C. Runyan, Mansfield, O.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report fourteen permits have been granted, the more important of which are the following: —

Joshua Regester, 3 three-st'y brick buildings, and two-st'y stable in rear, s s Chase St., between Caroline and Dallas Sts.

Geo. C. Herschman, 3 two-st'y brick buildings, n s Lancaster St., commencing n w cor. Luzerne St., and 6 two-st'y brick buildings, n s Lancaster St., commencing n w cor. Race St.

J. W. Parks, 2 three-st'y brick buildings, n s Randall St., between Battery Ave. and Williams St.

Joshua D. Taylor, 3 three-st'y brick buildings (square) w s Ensor St., between Monument and Madison Sts.

Old Town Fire Insurance Company, three-st'y marble-front building, w s Gay St., between High and Exeter Sts.

W. T. Phillips, 6 three-st'y brick buildings, s e Hollins St., commencing s w cor. Pulaski St.

Boston Fear, 6 two-st'y brick buildings, s s Lorman St., w of Fulton St.

M. A. Fredsrick, three-st'y brick building, n s Lexington St., between Charles and Little Sharp Sts.

Boston.

BUILDING PERMITS. — *Nelson St.*, near Boylston St., dwell 20' x 28'; Wheeler & Reed, owners; D. Johnson, builder.

Shepard St., dwell., 24' x 44'; Patrick Moore, owner; James Keefe, builder.

Saunders St., near Orchard St., dwell., 23' x 35'; Henry Baldwin, owner; W. J. Griffiths, builder.

Brooklyn.

BUILDING PERMITS.—*Forty-ninth St.*, n s, 280' e Third Ave., 2 three-st'y frame tenements, tin roofs; cost, $4,000; owner, Olof Mansson, 139 Thirty-ninth St.; architect and builder, O. Nilsson.

Herkimer St., *Nos.* 724-728, s s, 3 two-st'y frame (brick-filled) dwells., gravel roofs; cost, each, $2,500; owner, J. S. Denike; architect, A. Hill; builders, Stults & Sadler.

Flushing Ave., s s, 175' w Marcy Ave., three-st'y brick stable and car-house, gravel roof; cost, $70,000; owner, Brooklyn City R. R. Co., 10 Fulton St.; architect, A. W. Dickie.

Hamilton Ave., *No.* 255, e s, three-st'y brick store and tenement, tin roof, wooden cornice; cost, $6,500; owner, John O'Brien, 257 Hamilton Ave.; architect, G. Damen; builders, J. F. Nelson and C. M. Detlefsen.

Rodney St., s s, 152' 8" w Bedford Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, each, $6,000; owner, H. B. Scholes, 119 Bedford Ave.; architect, E. F. Gaylor; builder, J. Haughian.

Duryea St., n s, 140' e Broadway, 10 two-st'y frame dwells., tin roofs; cost, each, $4,000; owner, architect and builder, Wm. H. H. Glover, 850 Van Buren St.

Gerry St., *No.* 78, s s, three-st'y frame tenement, tin roof; cost, $3,500; owner and builder, D. Heinemann, 80 Gerry St.; architect, H. Vollweiler.

Stewart St., s s, from 150' to 200' e Broadway, 2 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,500; owner, architect and contractor, C. V. La Quesne, 40 Bleecker St.; masons, Cook Bros.

St. John's Pl., n s, 200' e Sixth Ave., 8 three-st'y brown-stone dwells., tin roofs; cost, $9,000; owner, George H. Engemann, St. John's Pl., cor. Seventh Ave.; architect, R. Dixon; builder, T. Fagan.

North Eighth St., *No.* 106, s s, 160' e Second St., four-st'y brick tenement, tin roof, iron cornice; cost, $8,000; owner, Wm. Schmit, 252 Second St.; architect, A. Herbert; builders, Mead & Son and C. V. Schneider.

Stanhope St., *No.* 8, s s, 275' w Evergreen Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $2,500; owner, architect and builder, E. C. Bauer, 22 Stanhope St.

Middleton St., s s, 105' e Marcy Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,700; owner, architect and contractor, John Rueger, 250 Moore St.; mason, B. Guensche.

Broadway, w s, 69' 3" s McDonough St, 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,100; owner, architect and contractor; John Rueger.

Middleton St., s s, 125' e Marcy Ave., 4 three-st'y frame (brick-filled) tenement, tin roofs; cost, each, $4,100;; owner, architect and builder, John Rueger; mason, B. Guensche.

Ralph St., n w s, 75' s w Evergreen Ave., three-st'y frame tenement, gravel roof, brick cornice; cost, $4,300; owner, John Menehan, Ralph St., near Evergreen Ave.; architect, F. Weber.

Evergreen Ave., w s, 25' n Ralph St., 2 three-st'y frame (brick-filled) tenements, gravel roof; cost, $8,600; owner, John Kenehan, Ralph St., near Evergreen Ave.; architect, F. Weber; builder, not selected.

Schaeffer St., s s, 100' e Broadway, four-st'y frame tenement, tin roof; cost, $5,000; owner and builder, H. Vollweiler, 788 Broadway.

Throop Ave., *No.* 149, e s, 25' s Hopkins St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,200; owner and builder, William Bruchhauser, on premises; architect, Th. Engelhardt.

Central Ave., *No.* 263, e s, 75' Harman St., three-st'y frame (brick-filled) store and tenement tin roof; cost, $5,000; owner and builder, William Schneider, Bushwick Ave., cor. Meserole; architect, Th. Engelhardt.

Park Ave., *Nos.* 607 *to* 637, n s, 175' w Marcy Ave., 16 three-st'y frame (brick-filled tenements, tin roof; total cost, $72,000; owner and builder, Geo. Straub, 11 Lewis Ave.; architect, Th. Engelhardt.

Bushwick Ave., *No.* 708, w s, 28' n Elm St., three-st'y frame (brick-filled) dwell., tin roof; cost, $5,000; owner and builder, Max Brill, 568 Bushwick Ave.; architect, Th. Engelhardt.

Central Ave., *Nos.* 153-159, n e cor. Suydam St., 4 three-st'y frame (brick-filled) tenements, tin roofs; cost, total, $18,000; owner and builder, Henry Roth, 213 Johnson Ave.; architect, Th. Engelhardt.

Gerry St., *Nos.* 102-112, s e cor. Throop Ave., 6 buildings, three-st'y frame (brick-filled) store and tenements, the others three-st'y frame (brick-filled) tenements, tin roofs; cost, total, $25,000; owner and builder, John Krummenauer, 163 Ellery St.; architect, Th. Engelhardt.

Chicago.

BUILDING PERMITS. — W. E. Trover, two-st'y flats, Polk St.; cost, $6,000.

Presbyterian Mission Church, one-st'y chapel, 310-314 West Erie St.; cost, $10,000.

J. Eggold, two-st'y hall, 152 Wisconsin St.; cost, $4,000.

L. R. Giddings, three-st'y flats, 435-443 West Lake St.; cost, $15,000.

J. Webb, 4 two-st'y dwells., 878-882 West Adams St.; cost, $16,000.

F. Rebrecht, two-st'y store and dwell., 923 West Twelfth St.; cost, $2,500.

T. E. Robinson, two-st'y store and dwell., 2712 Halsted St.; cost, $2,500.

T. M. Crowley, 4 cottages, 1223-1231 West Fifteenth St.; cost, $6,000.

J. Winterbotham, three-st'y flats, 357 Fifth Ave.; cost, $7,000.

Sacred Heart Convent, one-st'y addition to school; cost, $7,000.

J. Schmitz, three-st'y store and flats, 960 West Twelfth St.; cost, $4,000.

A. Peterson, two-st'y flats, 766 North Ave.; cost, $4,000.

A. Swartz, two-st'y store and dwell., 3402 State St.; cost, $2,600.

F. Serhard, two-st'y store and dwell., 931 West Nineteenth St.; cost, $4,500.

Phœnix Insurance Co. of Brooklyn, ten-st'y office-building, cor. Clark and Jackson Sts.; cost, $400,000; architects, Burnham & Root.

Mrs. J. Baker, two-st'y dwell., 1007 West Adams St.; cost, $3,000.

Dr. Maynard, two-st'y dwell., 1052 West Congress St.; cost, $2,600.

F. B. Clarke, 2 one-st'y dwells., 439-443 Robey St.; cost, $2,500.

F. B. Clarke, 2 two-st'y dwells., 435-437 Robey St.; cost, $6,000.

E. M. Wallser, two-st'y dwell., 3729 Prairie Ave.; cost, $3,500.

E. Mariner, two-st'y dwell., 3231 Groveland Ave.; cost, $5,000.

P. E. Gunlock, 2 two-st'y dwells., 1181-1183 Washington St.; cost, $15,000.

Mrs. G. R. Bishop, 5 two-st'y dwells., 153-161 Oakley St.; cost, $20,000.

P. Berry, three-st'y store and dwell., 898 North Halsted St.; cost, $5,500; architect, H. Sichel.

Kansas City, Mo.

BUILDING PERMITS. — Brick house, Penn St.; cost, $7,000; owner, H. B. Prudden.

Brick business block, West Ninth St.; cost, $25,000; owners, J. Dola & Son.

Frame house, Tracy Ave.; cost, $5,600; owner, Frank King.

Frame business block, cor. Seventeenth and Wyoming Sts.; cost, $9,000; owner, W. W. Lovitt.

Frame house, East Fifth St.; cost, $5,000; owner, Fred'k Weber.

Frame house, Park Ave.; cost, $7,000; owner, J. C. Hildrick.

Frame house, Park Ave.; cost, $3,500; owner, Allen Cochran.

Total value permits, 1885, brick, $32,000; frame, $36,535; mill, $750; total cost, $69,285.

Milwaukee, Wis.

THE PAST SEASON. — Building has been very extensive in this city during the season just drawing to a close. Some very expensive structures have been contracted for and in course of construction. Among the most prominent is the new office-building of the Northwestern Mutual Life Insurance Company, on the cor. of Broadway and Michigan Sts., to cost $500,000.

ARMORY. — The Light Horse Squadron are building a very handsome armory-building on Broadway, just north of the new Central Police Station, to cost $50,000.

ART-GALLERY.—F. Layton has contracted for a public art-gallery to be erected on the cor. of Jefferson and Mason Sts., at a cost of $75,000, which he intends to present to the city upon its completion.

DEPOT.—The Chicago, Milwaukee & St. Paul Railway Co. are building a handsome depot on Everett, Third and Fourth Sts., at a cost of $300,000.

JAIL. — The county authorities have just contracted for a new county jail, at a cost of $100,000.

BUILDING PERMITS.—J. F. Wallace, brick residence on Cass St.; cost, $4,700.

Schlitz Brewing Company, brick store, cor. Grand Ave. and Third St.; cost, $25,000.

Jas. Bannan, brick house, Eighteenth St.; cost, $4,500.

Wm. Bishop, brick house, Van Buren St.; cost, $6,000.

E. Reynolds, house, Cass St.; cost, $3,500.

J. F. Scanlon, brick store, cor. Murray and North Aves.; cost, $4,500.

H. Townsend, brick house, Farwell Ave.; cost, $3,500.

Mr. Woolcott, brick house, Marshall St.; cost, $7,000.

The Schlitz Brewing Co., brick store, Cherry St.; cost, $6,000.

H. Fitzlaff, two-st'y brick store, Third St.; cost $3,000.

M. Kohl, two-st'y brick store, State St.; cost, $3,800.

John Johnston, brick barn, Twelfth St.; cost, $3,500.

Mr. Kletsch, brick addition to the Republican House; cost, $4,000.

H. Fallon, brick dwell., Twentieth St.; cost, $4,000.

Schlitz Brewing Co., brick store, cor. Third and Lloyd Sts.; cost, $10,000.

Cook & Hyde, brick flats, cor. Grand Ave. and Eighth Sts.; cost, $105,000.

Minneapolis, Minn.

BUILDING PERMITS. —Wm. M. Walker, two-st'y wood dwell., s w s Fremont St., bet. Franklin Ave. and East St., n; cost, $3,000.

Albert Johnson, 4 two-st'y wood stores and 4 four-st'y flats, s e cor. Fourth and Fifth Aves., s.; cost, $3,000.

Chas. Mac C. Reeve, three-st'y wood tenement, n w s Fourth Ave. and Tenth St., s; cost, $10,000.

Carl A. Andersen, four-st'y brick and stone tenement; w s Sixteenth Ave., bet. East Twentieth and East Twenty-first Sts.; cost, $12,000.

James Chalmer, four-st'y brick and stone apartment-house, e s Tenth St., bet. Birch St. and Hawthorne Ave.; cost, $20,000.

James H. Conkey, one-st'y wood and brick planing mill, w s First St., bet. Twenty-second and Twenty-third Aves., n; cost, $12,000.

S. G. Cook and others, addition brick store and office-building, s e cor. Fifth St. and Hennepin Ave., n; cost, $50,000.

Frank Holmes, addition brick store and office-building, n w s Hennepin Ave. bet. Eighth and Tenth Aves., n; cost, $30,000.

Watts Bros. & Camerer, two-st'y wood dwell., e s Portland Ave., bet. East Twenty-seventh and East Twenty-eight Sts., s; cost, $3,500.

Mary J. Adrian, 2 three-st'y brick stores, w s Cedar Ave., bet. Washington Ave. and Third St., s; cost, $15,000.

Thomas A. Braun, two-st'y wood dwell., w s Second Ave., bet. East Sixteenth and East Seventeenth Sts., s; cost, $6,000.

P. G. Lamoreaux, 2 two-st'y wood dwells., e s Nicollet Ave., bet. East Thirty-second and East Thirty-third Sts., s; cost, $16,000.

P. G. Lamoreaux, 2 two-st'y wood dwells., w s First Ave., bet. East Thirty-second and East Thirty-third Sts., s; cost, $16,000.

Nellie G. Mortimer, two-st'y wood dwell., w s Garfield Ave., bet. West Twenty-sixth and West Twenty-seventh Sts., s; cost, $3,000.

F. B. Hart, two-st'y brick veneer dwell., n e cor. near Oak and Grove Aves. and Pl.; cost, $15,000.

Jno. N. Abrahamson, three-st'y brick store and flat, s e cor. Blaisdell Ave. and Twenty-eighth St., s; cost, $15,000.

Jno. N. Abrahamson, 2 two-st'y brick veneer dwells., s s East Twenty-fourth St., bet. Eleventh and Twelfth Aves., s; cost, $12,000.

L. Kimball, two-st'y wood dwell., e s South Girard Ave., bet. West Twenty-sixth and West Twenty-seventh Sts., s; cost, $3,000.

W. W. Price, two-st'y double wood dwells., n e s Thirteenth St., bet. Mary Pl. and Nicollet Ave., s; cost, $4,500.

New Haven.

Building Permits. — Following are the permits for new buildings issued since last report: —

Halleck Ave., 3 two-st'y frame dwells., 26' x 35'; cost, $6,000; owner, Andrew Morehead.

Lynwood St., near Elm St., two st'y brick dwell., 23' x 45'; cost, $4,500; owner, Mrs. Lena Hall.

Exchange St., No. 52, two-st'y frame dwell., 26' x 45'; cost, $3,000; owner, Jas. A. Thorpe.

Admiral St., two-st'y frame dwell., slate roof, 24' x 44'; cost, $3,000; owner, Geo. L. Austin.

George St., near Elliott St., two-st'y frame dwell., 27' x 44'; cost, $4,000; owner, A. M. Rice.

Whalley Ave., near Orchard St., two-st'y brick dwell., slate roof; cost, $4,000; owner, Mrs. Myron C. Reade.

Wallace St., near Collis St., three-st'y brick and stone building, 44' 6" x 44' 6"; cost, $8,000; owner, Mrs. C. B. Demarest; architect, L. W. Robinson; builder, David H. Clark.

Gregory St., brick and stone school-building, two stories and basement; cost, $25,000; owner, City of New Haven; architect, L. W. Robinson.

A large addition to the custom-house and post-office has just been completed, at a cost of $30,000.

New York.

Houses.—On the n s of One Hundred and Thirteenth St., 100' e of Eighth Ave., 14 three-st'y brick and stone houses, with a total frontage of 250', and a depth of 45' each, will be built by Mr. Francis T. Sargent.

On the s s of One Hundred and Sixteenth St., between Fourth and Lexington Aves., Mr. A. I. Finkle, the architect, will build a four-st'y and basement dwell. for his own occupancy.

On the n s of Seventy-eighth St., w of Ninth Ave., Mr. B. V. Levy will build nine houses from plans of Mr. R. Guastirino.

Flats.—On the n s of One Hundred and First St., 160' e of Third Ave., 4 four-st'y brown-stone flats, 25' x 65' each, are to be built at a cost of $60,000, for Mr. H. Chenoweth, from plans of Mr. J. C. Burne.

On the n w cor. of Second Ave. and One Hundred and Fourteenth St., 5 five-st'y brick, stone and terra-cotta flats are to be built for Messrs. Hollaster & Friedline, from plans of Messrs. A. B. Ogden & Son, at a cost of about $75,000.

Building Permits. — *Eighth Ave.*, w s, s of Centre Line, One Hundred and Thirty-second St., 3 five-st'y brick tenements, flat tin roofs; cost, $48,000; owner, Homer J. Beaudet, 1437 Lexington Ave.; architect, Richard R. Davis, 266 West Twenty-sixth St.

Ave. A, s e cor. One Hundred and Fifteenth St., five-st'y brick tenement, flat tin roof; cost, $18,500; owners, Christine Harnschan, 117 West One Hundred and Twenty-fourth St., and Edward Dressler, 500 East Eighty-first St.; architect, E. L. Angell, 40 Broadway.

West Thirty-sixth St., No. 433, five-st'y brick tenement, flat tin roof; cost, $16,000; owner, Daniel Lawson, 420 West Forty-seventh St.; architect, James W. Cole, 401 West Forty-sixth St.

Delancy St., s w cor. Willett St., two-st'y brick store and dwell., flat tin roof; cost, $4,000; owners, Maria Halsey, Caldwell St., New Jersey; John H. Hunter, agent, 333 Fourteenth St., Brooklyn; Patrick Rudd, lessee, 227 Delancy St.; architects, Julius Boekell & Son, 54 Bond St.

One Hundred and Fifty-fourth St., No. 675, two-st'y brick dwell., flat tin roof; cost, $5,000; owner, T. J. Oakley Rhinelander, 14 West Forty-eighth St.; architect, W. W. Gardiner, 1364 Washington Pl.

First Ave., w s, 50' n Seventy-fifth St., 2 five-st'y brick tenements, brown-stone fronts, flat tin roofs; cost, $44,000; owners, Kennedy & Dunn, 959 Third Ave.; architects, Thom & Wilson, 1267 Broadway.

Seventy-eighth St., n s, 75' w Fourth Ave., 6 four-st'y brick dwells., brick and brown-stone fronts, mansard, slate and tin roofs; cost, $108,000; owners, Wooley & Squires, 75 East Seventy-ninth St.; architect, James E. Ware, 239 Broadway.

One Hundred and Twenty-ninth St., s s, 60' e Lexington Ave., five-st'y brick tenement, flat tin roof; cost, $10,000; owners, Andrew Little & Son, Newburg, N. Y.; architects, Cleverdon & Putzell, 108 East One Hundred and Twenty-fifth St.

One Hundredth St., s s, 18' w Second Ave., 3 five-st'y brick tenements, flat tin roofs; cost, $54,000; owner, Martin Kenney, 1806 Third Ave.; architect, Wm. Graul, 12 Stanton St.

Sixty-eighth St., n s, 80' e Ninth Ave., five-st'y brick tenement, brick and brown-stone front, flat tin roof; cost, $20,000; owners, Boekel & McKeane, 30 Beekman Pl.; architects, Babcock & McAvoy, 64 College Pl.

Fifty-eighth St., n w cor. Eleventh Ave., two-st'y brick manufactory and office, flat tin and gravel roof; cost, $8,000; owner, Joseph Eastman, 1 East Seventy-second St.; architect, J. E. Terhune, 218 West Thirty-seventh St.

West Sixtieth St., No. 311, five-st'y brick tenement, flat tin roof; cost, $20,000; owner, Vincent P. Travers, 336 West Sixtieth St.; architect, George W. Hughes, 138 West Fifty-third St.

West Thirtieth St., No. 530, five-st'y brick tenement, flat tin roof; cost, $17,000; owners, Thos. P. Dunne, 231 West Thirtieth St., and others; architect, Thos. P. Dunne.

Third Ave., e s, 25' n One Hundredth St., 3 five-st'y brick tenements, brown-stone fronts, flat tin roofs; cost, $54,000; owner, Patrick H. McManus, 110 East Ninety-first St.; architect, Wm. Graul, 12 Stanton St.

Third Ave., n e cor. One Hundredth St., five-st'y tenement, brown-stone front, flat tin roof; cost, $20,000; owner and architect, same as last.

One Hundred and Thirty-third St., n s, 375' e Eighth Ave., 2 four-st'y brick tenement-houses, flat tin roofs; cost, $30,000; owner, Thos. J. O'Kane, 700 East One Hundred and Thirty-first St.; architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.

One Hundred and Thirty-fourth St., s s, 100' w Brook Ave., 7 two-st'y and basement brick dwells., flat tin roofs; cost, $31,500; owner, T. M. Adams, 15 West Seventeenth St.; architects, Wilson & Hudson, 490 Sixth Ave.

Sixty-second St., s s, 100' w Tenth Ave., 4 five-st'y brick tenements, flat tin roof; cost, $60,000; owner, Lucius A. Russell, 35 East Eighty-fifth St.; architect, F. T. Camp, 60 Liberty St.

One Hundred and Nineteenth St., s s, 145' e First Ave., 3 five-st'y brick tenements, flat tin roofs; cost, $37,000; owners, G. & J. Schreiner, 296 Mott St.; architect, John Brandt, 1491 Third Ave.

West Fiftieth St., n s, 125' e Twelfth Ave., three-st'y brick factory-building, flat tin roof; cost, $12,000; owner, Joseph Smith, 182 Eleventh Ave.; architect, Geo. B. Pelham, 56 Wall St.

Ninety-fourth St., n s, 250' w Ninth Ave., 8 three-st'y and basement dwells., flat tin roofs; cost, $80,000; owners, Stewart & Devlin, 1351 Second Ave.; architect, Jas. S. Post, 1507 Park Ave.

One Hundredth St., s s, 102' e Third Ave., five-st'y brick factory, flat tin roof; cost, $25,000; owner, L. Linsheimer, 542 Broadway; architects, Schwarzman & Buchman, *Tribune* Building.

Twentieth St., s e cor. Ave. A, four-st'y brick manufactory, flat tin roof; cost, $20,000; owner, P. J. Hartly, Twenty-sixth St. and Fourth Ave.; architect, Chas. Rentz, 80 Greenwich Ave.

Thirty-fourth St., s s, 79' 6" w Tenth Ave., five-st'y brick tenement, flat tin roof; cost, $22,000; owner, John Livingston, 130 East Seventy-first St.; architect, Fred. T. Camp, 60 Liberty St.

Tenth Ave., w s, 23' s of Thirty-fourth St., 3 five-st'y brick tenements, brown-stone fronts, flat tin roofs; cost, $48,000; owner and architect, same as last.

Tenth Ave., s w cor. Thirty-fourth St., five-st'y brick tenement, brown-stone front, cost, $22,000; owner and architect, same as last.

Philadelphia.

Building Permits. — *Lombard St.*, w Sixty-first St., 5 two-st'y dwells., 15' x 32'; Jacob Zell, owner.

Randolph St., n Master St., two-st'y dwell., 18' 6" x 26' 6"; Jno. M. Anderson, owner.

Carlisle St., n Oxford St., two-st'y stable, 19' 6" x 45'; P. H. Somersett, contractor.

Moore St., w Front St., two-st'y stable, 32' x 36'; J. Stratton, contractor.

Randolph St., n Oxford St., three-st'y stable, 14' x 24'; J. S. Quigley, owner.

Thirty-third St., cor. Lehigh Ave., one-st'y studio, 16' x 25'; Chas. Bartle, contractor.

Germantown Ave., cor. Huntingdon St., two-st'y stable, 14' x 45'; F. A. Colsmer, owner.

Tyson St., n Huntingdon St., 5 two-st'y dwells., 15' x 45'; Jno. Loughlan, owner.

Green Lane, n Wood St., two-st'y brick building, 16' 9" x 45'; Frank Gillet, contractor.

St. Louis.

Building Permits. — Eighteen permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Mrs. Joseph Robb, two-st'y brick dwell.; cost, $3,775; Simmonde, architect; J. V. Majors, contractor.

J. Schenk, two-st'y brick stable and shop; cost, $2,500; J. Schenk, contractor.

F. L. Block, two-st'y mansard, brick store and dwell.; cost, $3,500; C. May, architect; Wm. Kershieck, contractor.

A. Koon, two-st'y brick livery stable; cost, $3,000; Jas. Gates, architect; sub-let.

Mrs. Rockwell, 2 adjacent two-st'y brick stores and dwells.; cost, $6,000; Limmencole, architect; Doerner & Bro., contractors.

M. Kohring, 2 adjacent two-st'y brick tenements; cost, $3,200; Steinen & Bryer, architects; J. Schott, contractor.

Alex. Hamilton, two-st'y brick dwell.; cost, $4,000; G. H. Pipe, architect; E. C. Pipe, contractor.

Wm. Taylor, 2 adjacent two-st'y brick tenements; cost, $3,083; Aug. Beinke, architect; J. L. Aubnert, contractor.

E. Breuggemann, two-st'y brick dwell.; cost, $2,500; B. Otacke, contractor.

H. P. Jones, two-st'y brick dwell.; cost, $5,600; G. W. Pipe, architect; Brutt & Duffuener, contractors.

T. Maocossen, 2 adjacent two-st'y brick dwells.; cost, $5,300; Beumms & Thompson, contractors.

Chas. Stamm, 2 two-st'y brick dwells.; cost, $8,000; A. Beinke & Co., architects; Paulus & Weidemuller, contractors.

St. Paul, Minn.

Building Permits. — Two-st'y double dwell., n s Selby Ave., bet. Dale and Kent Sts.; cost, $4,000; owner, Mrs. W. Franklin.

Three-st'y brick veneer storehouse, w s Custer St., bet. Fillmore and Lever Sts.; cost, $4,800; owner, Minn. & N. W. R. R.

Two-st'y frame dwell., s s Dayton St., bet. Grotto and St. Albans St.; cost, $4,000; owner, E. E. Bowen.

Two-st'y brick veneer dwell., s s University Ave., bet. Lyndhurst and Westwood Sts.; cost, $3,000; owner, Wm. Defronsby.

Two-st'y frame double dwell., n s Dayton Ave., bet. Western and Arundel Sts.; cost, $7,000; owner, Paul D. Fergurson.

Two-st'y frame store and dwell., s s Taintor St., bet. Bapless and Hamlin Sts.; cost, $3,000; owner, St. Anthony Park Co.

Alter and repair two-st'y store and dwell., n s Main St., bet. River and Lizzie Sts.; cost, $6,000; owner, Albert Scheffer.

Washington, D. C.

Building Permits.—Plymouth Congregation, brick church, 40' x 58', cor. Seventeenth and P Sts., n w; cost, $10,000; Geo. B. Phelps, architect.

Geo. Turton, brick dwell., K St., bet. Tenth and Eleventh Sts., n w; cost, $7,000.

P. G. Sauer, 2 two-st'y brick dwells., E St., bet. Four-and-a-half and Sixth Sts., s w; cost, $3,000; N. Grimer, architect.

Dr. W. W. Johnston, three-st'y brick dwell., Thomas Circle; cost, $12,000; Hornblower & Marshall, architects.

Jno. Sherman, three-st'y brick dwell., N St., bet. Seventeenth and Eighteenth Sts., n w; cost, $12,000; F. G. Atkinson, architect.

Chas. E. Banes, 2 two-st'y brick dwells., F St., bet. First and Second Sts., n w; cost, $5,000; Cooper & Fenwick, architects.

Barbour & Hamilton, two-st'y brick warehouse, cor. Four-and-a-half and Virginia Aves., s w; cost, $18,000; Jno. G. Meyers, architect.

Henry Franc, 10 two-st'y brick dwells., cor. North Capitol and L Sts., n e; cost, $20,000; C. A. Didden, architect.

Gen. E. Whittlesey, three-st'y brick dwell., Iowa Circle; cost, $12,000; Hornblower & Marshall, architects.

Emma J. Carpenter, 3 two-st'y and basement brick dwells., Eighth St., bet. East Capitol and A Sts., n e; cost, $7,500.

C. G. Mueden, two-st'y brick dwell., H St., bet. First and Second Sts., n e; cost, $3,200.

Jno. Waggaman, 2 three-st'y brick dwells., Massachusetts Ave., bet. Ninth and Tenth Sts., n w; cost, $7,000; Cooper & Fenwick, architects.

W. C. Morrison, agent, three-st'y brick dwell., Iowa Circle; cost, $7,000; Jas. G. Hill, architect.

Three-st'y brick dwell., T St., bet. Thirteenth and Fourteenth Sts., n w; cost, $5,000.

I. H. McKenny, three-st'y brick dwell., Rhode Island Ave., bet. Fifteenth and Sixteenth Sts., n w; cost, $20,000; Wm. M. Poindexter, architect.

D. M. Ogden, two st'y brick dwell., Q St., bet. Twenty-ninth and Thirtieth Sts., n w; cost, $2,500.

Geo. B. Patch, three-st'y brick dwell., R St., bet. Thirteenth and Fourteenth Sts., n w; cost, $6,300; L. J. Stutz, architect.

E. F. Andrew, brick studio, Sixteenth St., bet. Rhode Island Ave. and M St., n w; cost, $3,500.

Three-st'y brick dwell., Massachusetts Ave., bet. Twelfth and Thirteenth St., n w; cost, $10,000; Chas. Edmonston, builder.

Geo. W. Pearson, three-st'y brick dwell., Massachusetts Ave.; cost, $7,000; Charles Edmonston, builder.

Three-st'y brick dwell., Massachusetts Ave., bet. Twelfth and Thirteenth Sts., n w; cost, $10,000; Chas. Edmonston, builder.

C. T. Trott, 4 two-st'y brick dwells., S St., bet. Ninth and Tenth Sts., n w; cost, $15,000.

Jno. R. McLean, 9 two-st'y brick dwells., N St., bet. Third and Four-and-one-half Sts., s w; cost, $10,000.

Geo. Whyte, three-st'y brick dwell., Maine Ave., bet. Four-and-one-half and Sixth Sts., s w; cost, $4,000; N. Grimm, architect.

Jas. F. Barbour, 6 two-st'y brick dwells., Wallace St., bet. Thirteenth and Fourteenth Sts., n w; cost, $15,000; Pitney & Bradford, architects.

Lanley & Gettenger, three-st'y brick warehouse, Twelfth St., bet. C and D Sts., n w; cost, $3,000.

Senator W. Call, three-st'y brick dwell., N St., bet. Nineteenth and Twentieth Sts.; cost, $12,000; F. T. Schneider, architect.

R. Fendall, three-st'y brick dwell., New Hampshire Ave., bet. Dupont Circle and N St., n w; cost, $12,000; W. M. Poindexter, architect.

General Notes.

Atlantic City, N. J. — Cottage in timber, for Mrs. Van Dyck; cost, $4,000; architect, J. A. Dempwolf, York, Pa.

Gettysburgh, Pa. — Judge McClean is building a library addition to his house; plans, etc., by J. A. Dempwolf, architect, York, Pa.

Hanover, Pa. — Mr. J. A. Dempwolf, architect, of York, Pa., has in charge remodelling of brick house for Miss Forney, with extensive interior alterations; probable cost, about $10,000.

Jersey City, N. J. — Frame cottage for G. A. Hammel; cost, $6,000; A. L. Hartwell, architect, Long Branch, N. J.; Peter McDonald, builder.

Frame house; cost, $30,000; A. L. Hartwell, architect, Long Branch, N. J.

Lakewood, N. J. — Frame hotel for A. S. Larabee; cost, $15,000; J. Grant, builder; A. L. Hartwell, architect.

Long Branch, N. J. — Addition to primary school-house, brick; cost, $7,000; A. L. Hartwell, architect; contract not given.

Frame cottage for Dr. S. H. Hunt; cost, $5,000; A. L. Hartwell, architect.

Frame cottage for Daniel O. Farrell; cost, $8,000; A. L. Hartwell, architect; built by owner.

Frame cottage for Daniel Edwards; cost, $13,000; A. L. Hartwell, architect; C. V. N. Wilson, builder.

Frame cottage for Norman L. Monro; cost, $20,000; architect and contractor, same as last.

Four frame cottages for Mary N. McDonald; cost, $7,000; F. Newcomb, carpenter; Monroe Poole, mason; architect, same as last.

Cottage for C. V. N. Wilson; cost, $4,000; architect, same as last; C. V. N. Wilson, builder.

Block of stores for Houston & Steinle; cost, $10,000; architect and builder, same as last.

Addition to High School building; cost, $20,000; architect, same as last.

Monmouth Beach, N. J. — Frame cottage for E. I. Hossman; cost, $15,000; A. L. Hartwell, architect, Long Branch, N. J.; builders, J. Ruehl; carpenter, M. V. Toole.

Near Princeton, N. J. — Frame farm-house for E. Conover; cost, $8,000; A. L. Hartwell, architect, Long Branch, N. J.

Red Bank, N. J. — Frame cottage for T. Kroener; cost, $4,500; A. L. Hartwell, architect, Long Branch, N. J.; Morton, builder.

Shippensberg, Pa.—A Presbyterian church, costing $35,000, is now building.

The city will build water-works next season.

Spring Grove, Pa. — Mr. P. H. Glatfelter is building a public hall and free reading-room, three-st'y brick, with stone dressings and terra-cotta cornice and panels; cost, $5,000; architect, J. A. Dempwolf, York, Pa.

Staten Island, N. Y.—A parsonage, to be attached to the Grace Methodist Episcopal Church, is to be built at Port Richmond.

York, Pa.—J. A. Dempwolf, architect, has in hand: Frame house for Capt. Geise; cost, $3,500.

Extension of business premises of P. A. & S. Small, with steam-heating by Kelly & Jones Co., Jersey City; cost, upwards of $12,000.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 521.

DECEMBER 19, 1885.

Entered at the Post-Office at Boston as second-class matter.

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A CURIOUS, as well as rather instructive incident, occurred not long ago in a competition in England, which is not without its moral, when compared with the circumstances of a recent important competition in this country. The town of Bournemouth is a flourishing place, inhabited by a rapidly-increasing population of rich people, who come there to enjoy the climate. To add to their pleasures it was proposed, some time ago, to construct an "Undercliff" drive along the sea-shore; and Commissioners were appointed to study the subject. The Commissioners, as such officials usually do, requested the town surveyor, who was of course familiar with the ground, and whose services could probably be had for nothing, to assist them in their deliberations, and to offer suggestions; and this naturally led to his preparing a plan embodying the fruits of his and their combined wisdom. When the Commissioners had gone far enough to be tolerably sure of what they wanted, they announced a competition, and appointed a professional engineer, Sir Joseph Bazalgette, as the sole judge in assigning the premiums. When the day arrived for inspecting the designs, one can imagine the surprise and pleasure of the Commissioners at finding one which confirmed their own conclusions in a striking manner, exhibiting nearly all the features which they had themselves thought to be desirable, and arranged in a similar way. Faithful, however, to their promises, which seem to have been kept in the most honorable manner, they left their expert to judge for himself about it, and were probably gratified at his selection of this particular design, which the *Builder's* critic calls "eminently practical and well thought out," for the first premium, awarding the second and third to two other "well thought out" plans. On opening the sealed envelopes containing the names of the authors of the designs, the winner of the first prize was found to be a Mr. Stewart, a civil and mechanical engineer temporarily stationed at Bournemouth; and it was not until some time afterwards that the discovery was made that the prize design was simply a reproduction and amplification of the plan made for the Commissioners long before by the town surveyor, who had brought his original drawing to Mr. Stewart, to be worked up into shape for competition. As it happened, Mr. Stewart was himself engaged on a design of his own, but he was kind enough to supervise the work of developing the surveyor's plan into competition drawings, which were made by the surveyor's son under his direction. When the drawings were finished they were sent in, together with his own design, under his name. The disclosure of this curious arrangement gave no small trouble to the Commissioners, who doubted whether the surveyor had not been guilty of a breach of faith in allowing his plan, made for them, to be used in such a way. The question was submitted to a very distinguished lawyer, who rendered an opinion that the surveyor had not failed in his duty toward them; but they were honorable enough to be unwilling to suffer any suspicion of unfairness to be cast upon their management of the competition, and reconsidered the award, throwing out altogether the design of the surveyor, advancing the winners of the second and third prizes to the first and second places respectively, and making a new selection for the third prize. It is quite likely that none of the designs will be executed after all, but the illustration of the fact that very scrupulous managers of competitions are likely to disappoint the expectations of persons who imagine that they have the "inside track," or some other private advantage, is worth reflecting upon.

THE Pullman sewage-farm has, it is said, proved successful and profitable this year, the net income having been five thousand dollars, after paying all expenses. This is a liberal interest on the cost of the sewage system, and the engineer of this, and the manager of the farm, may again congratulate themselves upon having maintained the success of the most important economical experiment of modern times. The population of Pullman is now about ten thousand. The fertilizing value of the wastes from dwellings is usually estimated at two dollars per annum for each person; so that Mr. Williams and his not less able coadjutor on the farm have succeeded in collecting the fertilizing matter, transporting it to a long distance, and applying it to the land, at a total cost which has consumed but three-fourths of its value. To show the significance of this result, we need only apply the same proportion to New York. It would be strange if the sewage from a large city could not be handled with greater economy than that from towns like Pullman; but, supposing the cost per capita to be the same in both cases, the application of such sanitary and agricultural skill as that shown at Pullman to the city of New York ought to result in turning six hundred thousand dollars a year into the municipal treasury. It will be long before such results can be attained in the great cities, but the smaller ones, of six, eight, ten, twelve, or even twenty thousand inhabitants, have now, in Pullman, an example of what may be done, under circumstances of climate, soil and topography as unfavorable as are to be found anywhere in the country, to solve with complete success the problem of sewage disposal. In its four years' experience all the important difficulties of detail have been met and overcome, and the knowledge thus gained is at the service of all who wish to avail themselves of it; and it cannot be long before those who hesitate to acknowledge the merit of the system will be looked upon with something of the ridicule which now attaches to the persons who imagine that the sap of plants nourished by sewage is contaminated by it, or who, like a certain wiseacre in England, profess to have discovered that the crows which pick up seeds and worms on irrigated farms become intoxicated, by reason of the beer contained in the sewage.

THE *Scientific American* for November 28 contains a long account of the dispute as to whether Philip Reis or Professor Bell was the original inventor of the telephone, and gives full-size drawings of the original instruments which Reis described and used in his lecture before the Physical Society of Frankfort in 1861. These instruments have been for something more than a year in this country, and, without alteration or repair, beyond the renewal of a wooden support for one end of a small rod, have done just what Reis said they would do, reproducing human speech, "not with a distinctness sufficient for every one," but transmitting "consonants pretty distinctly, and vowels somewhat less so," but plainly enough to allow practised operators to communicate perfectly a sentence containing fifty-six words. Reis's lecture, under the name of "Telephony by Means of the Galvanic Current," was published in the Report of the Frankfort Physical Society for 1860–61, with a drawing of the transmitter, and full descriptions, both of this and the receiving instrument, and directions for their use. After the publication of this paper, which excited much attention among scientific men all over the world, Reis made, invented and described improved forms, which proved much more efficient than the original instrument, and, as reproduced from his published descriptions, transmit speech with complete success. The Reis transmitter, according to the account, is nearly the same as that now in use, but has platinum electrodes instead of the carbon now generally used. The original receiver is not very clearly described, but consisted of a helix with a knitting-needle through the centre, connected in some way with a sounding board, on which it rests. What improvements Reis made on this, we are not informed.

TEN or twelve years after this, the account goes on to say, Professor Bell, who is said to have been familiar with Reis's writings on the subject, made a successful application for a patent for an instrument which he called "an apparatus for transmitting vocal and other sounds telegraphically." The instrument consisted of two cones, each provided with a membrane, to which was attached the armature of an electro-magnet. The electro-magnets were shown in the drawing which accompanied the application, as connected by a wire. No model was submitted, and, by his own testimony, Bell had never, when his patent was granted, got a word of articulate speech through any instrument whatever, and it is doubtful whether he could have done so if the instrument described in his application had been actually constructed, its design being extremely defective. On the day that Bell's application was made, a caveat, which is a preliminary application, made to secure a principle which the inventor has not yet carried out into perfect detail, was filed at the Patent Office in the name of Professor Elisha Gray, describing a plan for a telephone with a liquid transmitter. Although a caveat is required, by the rules of the Patent Office, to be kept in the secret archives of the office, Gray's plan is said to have been communicated to Bell, who subsequently constructed a telephone with a liquid transmitter, which, by his own testimony, was the first through which he ever obtained articulate speech. Although Reis's telephone had, fifteen years before, "reproduced consonants pretty distinctly, but vowels, as yet, not in an equal degree," the assignees of the Bell patent appropriated the name which Reis gave to his instrument, and laid claim to "the right to the transmission of speech by all known forms of electric speaking telephones," and have hitherto, in this country, successfully defended that claim. According to the *Scientific American*, "in no other country in the world has such a claim been even attempted to be maintained," and foreign electricians, as it says, wonder at the audacity and skill with which it has been so long maintained in the United States. We have great confidence in the fairness and skill of the *Scientific American* in such matters, and although we do not pretend to express any opinion on the controversy, we think we speak for a good many telephone subscribers in saying that if the facts bear out the *Scientific American's* view, a sufficient amount has already been extracted from their pockets to reward amply the "audacity and skill" which have directed the operation, and if the Bell monopoly rests on nothing better than the fact that Professor Bell once erroneously thought that he had devised a slight improvement on what Reis had made public half a generation before, it is quite time that it should be brought to a termination.

THE same journal publishes the arguments on Professor Bell's side of the telephone patent question, in the shape of a letter from Mr. E. Berliner, now of Washington, who is well known as the inventor of a special form of telephone, as well as of certain improvements in the Bell telephone. Mr. Berliner makes his letter mainly a statement of facts, asserting, first, that the Reis telephone, when used as described by him, will not transmit speech; but that if manipulated on Bell's principles, as was sometimes accidentally the case when used by Reis, it can be made to do so. Moreover, Mr. Berliner continues, the principle on which Reis based his instruments was clearly enunciated and described, under the name of "telephony," five years before Reis's experiments, in a scientific paper published in the city where Reis then lived. This paper attributed the discovery of the principle which it described to Charles Bourseul, to whom, as it appears, much of the credit of the invention of the telephone should be attributed. In regard to the assertion, which was made, we believe, without contradiction, in the hearing before the Secretary of the Interior, that Gray's caveat for a telephone employing a liquid transmitter was shown to Bell when his application was filed, and before Bell had made the liquid-transmitter telephone, through which he first succeeded in communicating speech, Mr. Berliner says that Bell's original application, which was sworn to several weeks before Gray's caveat was written, contained a description of the method of using a liquid transmitter, proving that Bell did not obtain the idea from Gray's caveat. Whatever we may think of the theory that the man who explains why an instrument works is entitled to the exclusive use of that instrument in place of the man who invented it, we only wish to give as impartial a view of the facts as possible; and it is no small satisfaction to believe, as, from Mr. Berliner's letter, we think we may, that the story of Bell's attempt to appropriate Gray's transmitter has no foundation.

THE *Builder* gives a plan and elevation of an apparatus which has been used here for two or three years, but has only just been introduced into England, for drying lumber rapidly and completely. The process ought to be called one of seasoning rather than drying, for, although it is completed in a few days, the effect is substantially the same as that of a year's water-seasoning, followed by a thorough drying in the kiln. Every one knows that the essence of a seasoning process, as applied to timber, is either the removal or the chemical change of the sap contained in the pores of the wood. This sap is an albuminous fluid, of complex composition, and very subject to fermentation and putrefaction. If it is allowed to remain in the wood, the sap is liable, if the timber is not thoroughly dried, to decompose, and its putrefaction extends to the substance of the wood, causing it to rot. If the wood is dried with the sap in it, the tendency to fermentation is arrested, but the gum formed by the dried sap has, like many other organic substances, the property of absorbing moisture from damp air, and the wood containing it is thus subject to irregular swelling and contortion. The ancient method of extracting the sap was to float the timber for a year or two in water, which dissolved out the albumen and sugar, leaving nothing but the inert cellulose of the woody fibre, but this is too slow a process for the moderns, who content themselves with exposing the timber for a short time to the air, and then drying it, with much of the sap still in it; or, if it is absolutely necessary to check the tendency to decay, the sap is coagulated by injecting chemicals, as in the Burnettizing and Kyanizing processes, or is sucked out with an air-pump, to be replaced with oil of creosote, as in the creosoting process. None of these methods of treatment except the last, approach in economy and effectiveness the old process of floating, but the new apparatus, which is known in England by the unpretending name of the "Common-Sense Timber-Dryer," seems to offer a means for securing the advantages of the ancient method, in the short time which our present habits allow us to devote to such processes.

IN the "Common-Sense Timber-Dryer" the sap is removed by the action of hot watery vapor. The pieces are piled in a closed chamber, heated by steam pipes, and a jet of steam is thrown into the chamber. The temperature of the room is kept at about one hundred and twenty-five degrees Fahrenheit, so that the albumen in the sap is not coagulated, but dissolves in the condensed vapor, and flows away. The wood is kept in this vapor bath for several days, until the soluble parts of the sap are considered to have been removed. The process is then reversed. The steam jet is shut off, although the room is still kept hot by the coils of pipe, and a fan-blower is set in motion to draw the saturated air from the room. It is forced through the outlet-pipe of the fan to a condenser, which is simply a cylinder, cooled by circulation of water, or in some other way, and is then chilled. The reduction of the temperature causes the condensation and deposition of most of the moisture contained in the air, and it is then forced, comparatively dry, again into the closed chamber, where it issues from a perforated pipe laid on the floor near the steam coils, and, becoming warmed by contact with them, rises among the wet timbers, to take up a fresh dose of moisture from them, which is again condensed, and the air dried and returned in the same way. As the circulation continues, the moisture in the wood gradually evaporates, until, at the end of eight or ten days, the whole charge of timber is dry, ready for conversion into joiner's work. Independent of its superior efficacy in dissolving and removing sap, the new process has the advantage over the common system of air-seasoning of being perfectly under control; so that there is no loss from blackening and splitting, such as takes place with boards exposed to rain and sun out of doors; and the product has a uniform character which can seldom be secured in ordinary lumber. These considerations are so important that some piano manufacturers in this country, who need the most thoroughly seasoned and perfect materials that can possibly be procured, are said to prefer green wood, freed from its sap and dried in this way, without any floating or exposure to the weather, to the best timber seasoned by the ordinary methods.

NOTES OF TRAVEL.

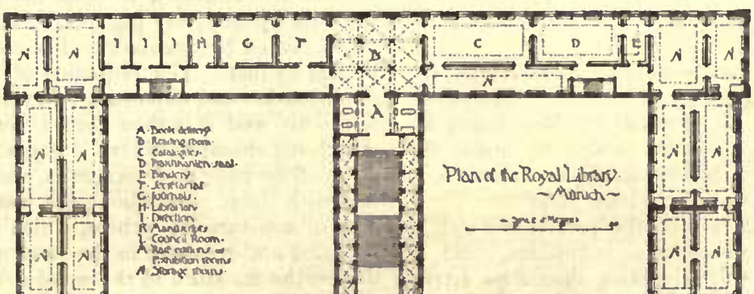
MUNICH.



THE Royal Library at Munich is one of the many monuments which the city owes to King Ludwig I, the ruler who did so much to raise his capital in every department of art. As a collection, the library is of quite ancient origin, but in its existing form and arrangement it dates only from 1842, when the present building was completed and opened. It is now one of the largest of the European libraries, comprising over 900,000 volumes and 25,000 manuscripts. The arrangement of the building leaves a great deal to be desired in nearly every respect, though there are some valuable ideas to be derived from it; and, aside from its including so important a collection, there are points in the arrangement of the rooms which, under different conditions, might seem to show a more definite purpose in the minds of the planners than one would at first suspect, and which give the building an interest to any one who would make a comparison of European libraries. Ludwig I intended that everything about Munich should be magnificent, at least if size could make it so. The streets are wide, the Ludwig Strasse, in fact, is rather too wide for any good effect; the Pinakotheks, both old and new, would be much better if reduced in size; the railway station is one of the largest on the Continent; and the library in turn follows the lead by providing storage accommodations for at least four times the number of volumes which is ever likely to be placed there. The building is too magnificent, too diffuse in all its parts; but assuming that the architect intended to plan for a library the size of the Bibliothèque Nationale at Paris, it is easy to see that his scheme was a natural one to follow, and one which even now could be better adapted to existing conditions than we find it to be.

The plan shown herewith is taken at the level of the main story, the second floor, as we would term it. Externally the library presents a plain, unbroken front of about 500 feet, in three strongly marked stories, with round-arched windows of broad proportions, and a long, wearisome, corbelled cornice, the whole assumed to be in the style of the early Florentine Renaissance. The entrance from the street is in the centre of the façade under the room marked L in plan. The lower story is occupied almost entirely by the Bavarian National Archives. The library proper is reached thence by an imposing staircase in the central wing of the building. At A is the vestibule, where books are applied for and returned. Beyond it is the reading-room, seating not over sixty persons, with the catalogue-room on the right, and the room for journals close by on the left. The reason for having such limited accommodations for readers is that most of the books used are lent out of the building, a feature common to the management of nearly all the German libraries, as distinguished from the custom in Paris, where nothing is allowed to be carried away. The reading-room in the Munich Library is found to be quite ample for the accommodation of the transient readers.

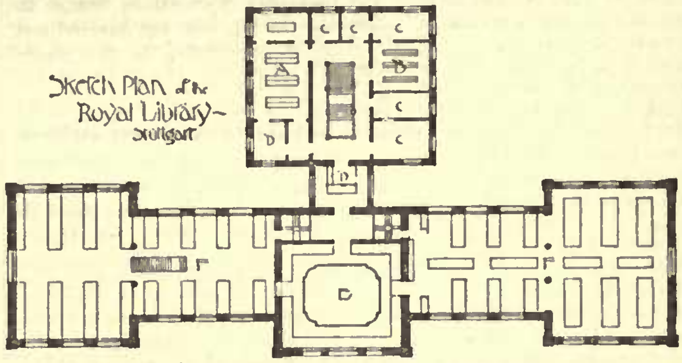
The room over the entrance is designated as a hall for meetings, but actually it is a great, bare apartment, having the air of being but little used. The corner room at the right of the front is fitted up as an exhibition room for rare editions, etc.; a corresponding room on the left contains the most curious of the manuscripts, many of them in glass cases; the offices of the Direction are at the rear at F and I; and all other rooms of this floor as well as the corresponding rooms of the story above are used for the storage of books, the shelving being built against the walls in three tiers, with two light galleries throughout. The shelving, galleries and flooring are everywhere of wood.



The defect of this arrangement is chiefly that the storage rooms are so scattered that the books are not readily accessible from the reading-room, while the available space is not more than a quarter utilized. Were the number of volumes quadrupled this objection would not be so apparent, as the additional shelving would leave little waste space; but it would seem as though with the present number a better plan would be to classify both books and readers, as is done in the University Library at Vienna, arranging say Theology and the Sciences in the two rear wings of the building, while History and Languages occupy the front, the two rooms L and B serving as reading-rooms for the respective classes of readers. This would allow the books to be quickly reached, and the division of the readers in two rooms would hardly be an objection. Indeed in quite a number of the German libraries just such division is really made. But as at present utilized the plan of the Munich Library is hardly a success, and the management does not tend to increase the value of the collection to the student. The catalogue is still in a formative state, and though open to everybody's inspection is not always intelligible, even to the attendants themselves. The reviews, etc., in the journal room are reserved for members of the Academy and professors at the University; and the service of the library is so slow as to quite discourage any one who is at all inclined to be in a hurry.

The library possesses a number of curiosities in the book line. There are manuscript sermons of St. Augustine; a Latin Book of the Gospels written on purple vellum with gold and silver letters; the oldest manuscript of Parcival and the Nibelungenlied; Albert Dürer's Prayer-Book, with sketches by himself and Louis Cranach; several richly-decorated old manuscripts, lavishly bound with solid gold set with precious gems; and what is of more historical interest, the first page printed from movable types, the first wood-cut, the first electrotype, and the first lithograph.

In the way of convenience and comfort in arrangement, the people

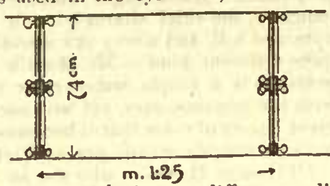


of Munich might learn a great deal from their neighbors in Wurtemberg. The Royal Library at Stuttgart is one of the pleasantest places in which to read in all Germany. The collection numbers barely three hundred and sixty thousand volumes, but the catalogue is so full and so admirably arranged, both by topics and by names of authors, that all of the books are at the reader's command; while the reading-room is carpeted and upholstered in a style to suit the most fastidious, and is amply provided with comfortable chairs, book-rests, pens, ink and blotters. The regulations regarding the use of books are most generous, allowing them to be consulted freely at the library or taken out for a number of days, and the porter is conveniently allowed to deliver books at the homes of the readers without personal application by them. The building is of quite recent date; indeed some portions of it are but just completed. The plan given above was sketched from memory and indicates only the general disposition. The reading and catalogue rooms, as well as the offices, are in the rear wing, which, on account of the slope of the ground, is a story higher than the rooms shown in plan at the front. A is the reading-room; B contains the catalogues; the offices are at C, and the delivery of books at D. Large portfolios of prints, heavy folio editions, etc., are kept in the room E, where those who wish to consult such works can examine them at their ease without interfering with the general readers, the room being provided with ample tables on which the cumbersome volumes can be opened out as desired. This room has a gallery at the level of the reading-room A. Other books and manuscripts are stored in the rooms F. The entrance to the building is under the room E, the stairs ascending to the main floor, the reading-room being reached thence by a hallway under D and stairs in the centre of the wing.

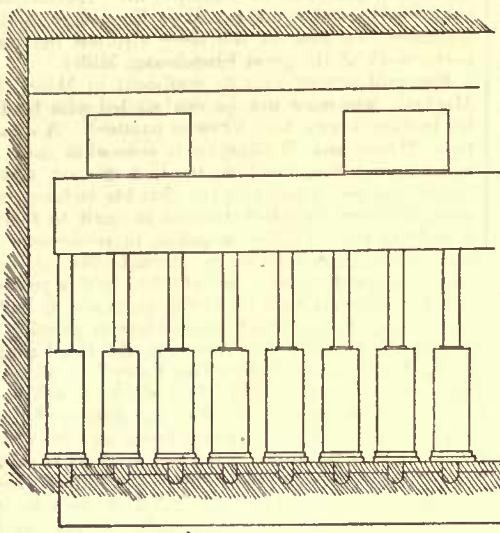
The storage facilities are well adapted for utilizing the whole of the space. The arrangement is somewhat after the order of that used in the Vienna University Library. The rooms are about nine metres high in the clear, the shelving being continuous from top to bottom, with their intermediate galleries extended across the whole area. The uprights for the shelving are made of single plates of iron extending the whole height, to which are bolted directly the channel-iron beams supporting the galleries. The sketch shows a plan of one section of the shelving. The shelves rest on flat-headed iron pins fitted into holes bored at intervals in the uprights. The floors of the galleries are of wood, everything else about the construction except the shelves being of iron. The lower portions of the building are occupied by various national collections, quite distinct from the library.

Returning to Munich: there is a system of heating in use at the Polytechnic Institute which is quite novel in its way. Steam is used for portions of the building, but for the main rooms heat is supplied from chambers in the cellar, where constant fires are maintained in small, portable stoves, disposed essentially as indicated by the drawing. These stoves consist simply of cylinders of cast-iron, twenty

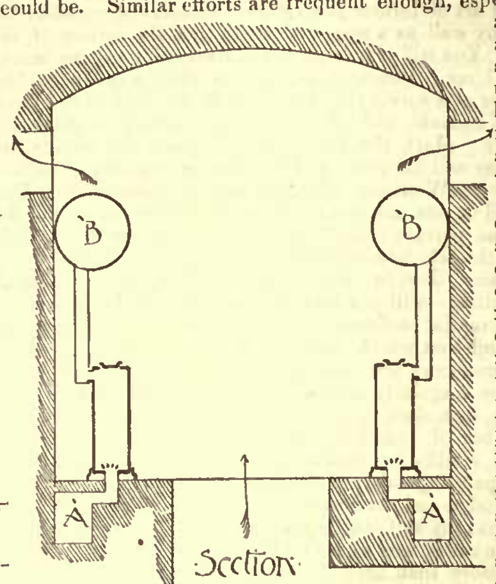
centimetres in internal diameter, and about fifty-five centimetres high, with a small air inlet and grate at the bottom, a movable cover at the top, and a short elbow at the back. The cylinders are set on iron stands over openings from a fresh-air duct, the elbow at the back fitting into a small branch of smoke-pipe. The cylinders are not secured in position, but can be readily lifted out by iron handles, not shown in the drawing. Coal is used in the cylinders, the combustion being started at the top and allowed to work down until the fuel is thoroughly consumed. The supply of coal in one cylinder lasts for about four hours and a half. As many cylinders are fired as is necessary to supply the requisite amount of



heat, fire being started at regular intervals in the different cylinders, so that in replenishing the fuel there need be no loss in the amount of heat supplied. If the temperature rises too high, one or more cylinders can be lifted off their stands, carried out of the chamber, and the fire in them extinguished. If more heat is needed, more cylinders can be fired. The heating-chambers are built of brick, of sufficient size to receive from sixteen to twenty-four such cylinders. The fresh air enters the chamber from out of doors through a grating in the floor, becomes heated, and is led to the rooms above through flues taken from near the top of the chamber. The air for the combustion in the cylinders is drawn quite independently from the cellar beyond, through the ducts A, the supply being regulated by valves which can be operated without entering the chamber. At B are the smoke-pipes.



·Elevation·

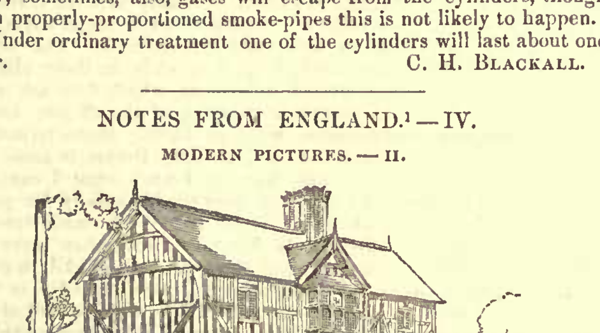


The advantages of this scheme are obvious. It is economical of fuel, as when the combustion takes place in such small quantities it is easy to burn only the exact amount of coal required to produce a given temperature. Again, the stoves require very little attention and give a very constant heat, while fire is easily and quickly started or stopped as desired. The main objection is that the supply of fresh air to the rooms above is apt to carry with it a great deal of dust; sometimes, also, gases will escape from the cylinders, though with properly-proportioned smoke-pipes this is not likely to happen.

Under ordinary treatment one of the cylinders will last about one year. C. H. BLACKALL.

NOTES FROM ENGLAND.[1] — IV.

MODERN PICTURES. — II.



The Village School Bromfield. Engd from sketch by E. J. May. Archt

IN addition to the pictures by Mr. Millais already noted (and to sundry others I should like to describe were I not afraid of being prolix), I was fortunate enough to see, in a private collection, two of his earlier, most famous, and most characteristically perfect, works. They are very dissimilar, and yet they were alike in being, each in its own way, what I may call imaginative portraits. One of them was the "Gambler's Wife," which, when exhibited at the Paris Exposition of 1878, called forth an exceptional share of the unstinted admiration bestowed upon the artist's pictures as a whole. It is a comparatively small canvas, with a single figure, a beautiful young woman sadly fingering a heap of cards on a disordered table;—a "story-telling" picture of the right and not the mistaken sort, with a subject proper to pictorial, not merely to literary expression, and telling its own tale at the first glance without need of any title, still less of any explanatory catalogue-phrase. It is pathetic, dramatic, moral; while its motive is so exquisitely conceived and treated, that it would be a priceless treasure by reason of its pictorial beauty merely. Its grace of line, its rich, yet tender glow of color, its luminous depth of tone, its consummate precision yet breadth of handling are as remarkable as the strong, yet simple, unforced, unsentimental pathos of its meaning, everywhere expressed, but culminating in the lovely face. Wordsworth somewhere says that a work of art should make us either wiser, better or happier. This picture fulfils all these ends at once — for it is a lesson in life, a lesson in beauty, and a lesson in picture-making too.

The second canvas not only may be called, but definitely calls itself an imaginative portrait and of a real historic personality. It is an imaginative likeness of Swift's Stella, — a seated, life-size figure, conceived and treated as simply as any contemporary likeness well could be. Similar efforts are frequent enough, especially in English art — but almost always with a result that is either utterly characterless, or absurdly mistaken and inadequate. But this rendering of Stella — surely as difficult a subject as could well be chosen — is so full of character, so right and so adequate, that it not only satisfies wholly our imagination, but stimulates and clarifies it as though we had come for a moment into the actual presence of the woman herself, and had been endowed for that moment with the birthright of a great artist — with the power of reading the inmost soul beneath the outer surface. If ever a great artist had painted the real Stella from life, he could not well have left us a portrait more satisfying, or, spiritually, more true. Nor, as a mere picture, moreover, could it easily be equalled — masterly in drawing and in simplicity of arrangement, superb in color, and magnificently strong and tender in handling. Strong and tender are two adjectives one cannot very often use together in speaking of any modern painter. But they are the two which constantly suggest themselves when Mr. Millais is at his best — suggest themselves as applicable alike to the sentiment of his work and to the drawing, the color and the technique by which that sentiment is expressed. Virility of mood and manner is so rare a quality in English art that the possession of it alone would rank Mr. Millais very high. But when we remember that to this he adds feeling of a depth and purity almost if not quite unmatched in the contemporary world of art — then, indeed, we hesitate whom to place before him in his own line of work. To elaborate compositions of many figures, to dramatic renderings of mighty themes, to idealizations of the subtilest intellectual, or the most purely decorative, sort, his genius does not tend. But in his own line (there is none deeper, or more human, or more spiritual) in the line of portraiture, whether it be actual likeness-making or that imaginative likeness-making which is the noblest kind of *genre*-painting, he has not, I think, an equal to-day, and would hold his own with the great names of history. There is nothing attainable we should wish for more than that a collection of his best pictures might follow the Watts collection over the Atlantic. I did not see the latter in New York, and I have seen too few of Mr. Watts's pictures in England to venture upon any comparison—even if a comparison were really possible between artists so unlike. But I may, perhaps, say that a collection of Mr. Millais's pictures would contrast with the one just closed in two diverse ways. It would show a characteristically modern and characteristically English art, while the other showed an attempted resuscitation of the Italian art of a bygone time; and while it would not reveal so ambitious an aim, it would show a much more perfect realization of the aims suggested. It would show perfect clearness and artistic balance in conception, expressed in a perfectly accomplished technical language; — something less than this seems to have been the general verdict upon Mr. Watts's work.

It is extremely curious to note how faintly indicative of the best is the average of current English painting. Not only is the numerical proportion of very good works extremely small, but their quality is not even remotely suggested by the quality of those which rank below them. Bad English pictures, mediocre, average English pictures are worse, I think, than those of any other land, not excepting

[1] Continued from page 259, No. 518.

our own;—worse in their execution and worse too in the fundamental conceptions with regard to the very nature of pictorial art which they reveal. They are so crude and bald and unintelligible, they are so prosaic in spite of their sentimentality, and they are so homogeneous and uniform in the direction of their stupidity, that they do not in the least prepare us for the qualities which mark the few triumphant exceptions, these being the qualities of intense individuality, of extreme refinement, of grace and charm and tender sentiment. No art is so underbred, so vulgar, without, of course, being in the least sensual, so commonplace, so Philistine, in a word, as is the average art of England, while no art is quite so personal, so high-bred, so fastidious, so delicate, so poetic as is the art of England in its best examples. Not strength, as we might expect from the general trend of the national character, but tenderness—alike in conception and in execution—is its most constant, most conspicuous quality.

And the same essential difference between the best and the average which we find if we consider English art in its general mood and temper, we find to an even more marked degree if we consider it in its color. Go into those rooms at the National Gallery, where the selected English art of former generations is preserved, consider the total effect of any wall as a map, and study then the surface of any of its canvases. You will marvel at the richness of tone, the beauty of color you will see. Deficient, perhaps, in other ways these elder Englishmen were of a surety colorists by birth. Go then to the Royal Academy of the moment, and—if you have the courage — study it in the same manner. Mark the harshness, the glare, the crudity, the utter want of tone and harmony, and the hideous brutality of individual notes of color. Whatever else they may be, these modern Englishmen, you will decide, are surely the worst colorists on earth. But go now into some private collection where an amateur's sure taste has anticipated the selective action of time, and you will change your verdict once again. Just in color — not in drawing, nor in composition, nor in handling—will you find the strongest proof of power.

Given this essential difference of quality between the very best English work and that which ranks even next below it; given the facts that its producers are comparatively very few in number and each is apt to be singularly unequal in his own performance; and, finally, the fact that their results are not in the way of monumental public art, but of household cabinet art — given these facts, I say, and it will readily be comprehended that it is impossible to judge English painting fairly if we merely run through the public buildings of London and its monster annual exhibitions. We must seek the somewhat shy and fragile plant in the studio, where it grows, or in the private collections where its flowers are lovingly preserved. I, for one, had more than once seen all the stranger can usually see in London; but when I was fortunate enough not long ago to make acquaintance with Mr. Humphrey Roberts's collection (he has kindly given me permission to speak of it here), I felt that for the first time I knew the meaning of the words "English painting."

Large as is the collection most of the pictures are of comparatively small size; and for this reason, as well as on account of the intimate, delicate quality of the art they reveal, they are seen (or perhaps I should say they are *felt*) to far better advantage as they hang on the walls of the various living-rooms than they would be if massed together in a formal gallery. All are English pictures with the exception of a very few, and these are chiefly by the Dutch painter, Israëls, whose work is closely akin in sentiment, though not in executive manner, to the best work of England. And, as I remember, there is not a single painting which has not a very good right to hang among its admirable neighbors;—at all events, I remember very few collections in any land where so high a level of excellence seemed so seldom to sink below itself, I can only note of course, a few of the more impressive pictures. Several of them, I am sure, will be familiar to my readers, through etched or engraved reproductions, ranking as they do among the most famous, as well as among the best of recent English productions. First of all (first, that is, since Mr. Millais's two splendid canvases have already been described), I am tempted to speak of the work of Frederic Walker who died in 1875, at too early an age for his remarkable powers to have received their full development. It is thoroughly English work, alike in its excellences and in its limitations. It is exquisitely poetic in feeling, lovely in color, adequate and characteristic, but not brilliant in execution, and weakest in the point of composition. The "Harbor of Refuge," for example (which hangs among Mr. Roberts's water-colors, and has been etched by Mr. Macbeth), shows the quadrangle of a quaint and beautiful old building at Bray, on the border of the Thames. An old woman, supported by a young girl is slowly pacing the path which encircles the central grass-plot, where a mower is at work under the soft sunset light. It is a lovely *scene*, but not, I think, in the strict sense a well-composed *picture*. Yet perhaps if effects of line and mass had been more distinctly emphasized in it, there would be a certain loss of that vague, dreamy, naïvely tender sentiment, which is its greatest charm as it stands to-day. I think, at all events, that this charm is increased by the absence of emphasis, of accent, of brilliancy from the execution, which shows a soft, blended mellow kind of handling — a kind which with lesser men easily degenerates into washy weakness, and which with some subjects would be out of keeping, but which with Walker and with this subject seems artistic, lovely and essentially appropriate! And lovely is the term to use of the color, too, with its low, dull harmonies of ruddy tints vivified by a blooming pear-tree on the right. An exquisite picture indeed, and one which is poetic in the way a picture should be—not by trying to tell a "literary" tale, not by choosing a subject which is poetic to the mind alone, but by choosing a subject which is poetic to the *eye*, and suggestive to the mind no less, and by rendering it with poetic color and manner of expression. It affects us as might a touching elegy in verse, but the effect is wrought by elements of a purely pictorial sort. Much the same may be said of a small work in oils by the same hand. It is called "The Plough," and its subject is simply what the name indicates, the chief charm lying in the color — red cliffs beyond the upturned soil, and a rosy sky above. A third work, however, is of a quite different kind — Mr. Ruskin has made it famous by unstinted praise — is a simple water-color study of scarlet fungi, elaborated with the minutest care, yet with such breadth, such feeling, and such vivid beauty of color that it becomes not a mere botanical illustration, but a thoroughly artistic presentation of an artistically valuable theme.

Of George Mason — who was an older man than Walker, but who died at about the same time and whose art is similar to Walker's, though expressed with a completer technical mastery than the latter had attained to in his brief existence — there is one example in this collection, the landscape in Derbyshire. It shows all the tender pathos of his brush, though, by reason of its less striking subject, it is not so well known as, for example, his "Harvest Moon." Both these painters, it seems to me, reveal an English phase of the same sort of sentiment we find in the more vigorous but not more intense or poetic work of the great Frenchman, Millet.

But still nearer akin in sentiment to Millet, I think, is Robert Macbeth, who must not be confounded with his father, Norman, or his brother James, both likewise painters. A somewhat later comer than Mason and Walker, he is somewhat more "realistic" in his mood; yet not so much so but that his art may be classed with theirs, and not so much so but that his etchings from Walker's pictures have been singularly truthful in spirit to their originals. He is a striking proof of the inequality in performance to which I have more than once alluded as characteristic of English artists. No one who saw the canvas he exhibited in this year's Academy — shallow and commonplace in sentiment, crude in color, rough and careless in execution — could imagine him as painting "The Potato Harvest in the Fens," "The Arrest in the Fen Country," "The Flood in the Fen Country," or "The Ferry" — all of which are in Mr. Roberts's collection, and all of which, it will be noticed, deal with various incidents of life in the same district of England. It is a district which, alike in its natural forms and in its human types, lends itself well to Macbeth's better mood, which is prone to choose "realistic" subjects from humble life, yet to infuse them with a sensitive, subtile melancholy. It is the mood of one who loves the homeliest side of rural existence, and wishes to portray it simply, yet who nevertheless loves it and portrays it as it appears to a highly-cultivated liver in cities, as something familiar yet remote, natural yet pathetically alien, homely yet poetic by reason of its unlikeness to the sophisticated modern life beyond it. It is a mood that is as distant as the poles from the frank *actualité* with which current French art paints its peasants, and as distant from the false and trivial "idealization" with which inferior artists all the world over try to give charm to their results. It is akin in one way, I repeat, to the mood of Millet — akin in its choice of subject-matter, in its love of truth, in its unforced natural pathos. But it is different in another way, by reason of the remoteness, aloofness of attitude to which I have already referred. Macbeth is in vital sympathy with the themes he represents, but his sympathy is imaginative while Millet's sympathy was that of a brother in birth and circumstance. The peasant strength of Millet's work is lacking, too, while in their place we have a delicate, almost morbid refinement, which does not reveal itself, I say, in any sentimental travestying of the subject, but (in some intangible, indescribable way) as having characterized the painter feeling when he saw that subject. Jules Bréton, in some of his smaller canvases, comes nearer than any French artist I can name to working like Macbeth; but even here the likeness is far enough from approaching to identity. There is more dramatic intention (and it is admirably conveyed) in Macbeth's work than there is in Walker's, but there is something of the same lack of skill in composition. Only in one of the four pictures I have named — in "The Ferry" — is there so effective and beautiful an arrangement of lines and masses that we are struck by it as by a final charm completing the charming, the touching and impressive whole.

Albert Moore is an artist of a very different kind, having nothing whatever in common with these others save a fundamental, underlying delicacy and refinement of feeling. He works on decorative lines — produces charming figures which are quite devoid of soul, of any intellectual or emotional quality, but for the mere delighting of the eye have an extraordinary value. He has often been imitated, but very seldom with success; for art of this kind must be perfect within its own limits, else it is absolutely nought. It must be perfect in line and color and tone and touch, for there is nothing beneath these to console us if they fail to satisfy. If not perfect it inevitably sinks into thin, tiresome inanity, very likely into half-ludicrous caricature. Mr. Moore's art has often enough been caricatured and (in justice to his own fame I must add), occasionally by his own hand. But Mr. Roberts's specimens are exquisite. One especially, a small canvas with the figures of three young girls who are leaping over a wall, is a ravishing little "symphony in yellow," and as graceful in line as gracious in its clear, light color and accurate, dainty touch.

M. G. VAN RENSSELAER.

THE ILLUSTRATIONS.

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

THE CATHEDRAL AT COUTANCES, FRANCE.[1]

THIS is certainly one of the most interesting of the many churches in Normandy to which architectural pilgrimages are nowadays made. It is, moreover, one of the earliest complete pointed churches in France, as it dates from the first half of the thirteenth century. The western spires and their curious supporting spirelets have a very unusual slender elegance, and the simplicity of the lines makes them more than ordinarily impressive. Another feature that impresses itself on the memory is the curious manner in which the vault-ribs are carried down onto corbels and colonnettes, to die away in the surface of the wall.

SANTA MARIA MAGGIORE, ROME, ITALY.

ALTHOUGH known by other names, this building, the largest of the eighty or more churches in Rome dedicated to the Virgin, is best known by the title given above. The building in its original basilican form dates from the fifth century, being usually assigned to the time of Pope Sixtus III, A. D. 432. Although only a three-aisled basilica in plan, whereas St. John Lateran has five aisles, it is considered to have one of the finest interiors of its class. The internal dimensions are, length 250 feet, width 100 feet. Of the original edifice the nave is still retained without material alterations. The exterior, however, has been subjected to alterations and restorations, according to the manner of the times. Thus, in the twelfth century certain mediæval additions and changes were made; in the fourteenth century the campanile was given its present form by Gregory XI; in the fifteenth century the mediæval alterations were expunged and the present symmetrical arrangement of the church and its accessory buildings was fixed, and in the following century other chapels were added. The final alteration was however undertaken by Fuga, about 1743, in the time of Benedict XIV, who designed the façade shown in the view we publish.

HOUSE FOR G. B. CHASE, ESQ., MARLBOROUGH, N. H. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, BOSTON, MASS.

SECULAR TOWERS — MAINLY LATE MEDIÆVAL.

As these towers are grouped together simply as suggestions in design, it does not seem worth while to give any facts concerning each particular example.

THE PRINCIPLES OF HOUSE DRAINAGE.[2]



Children's Hospital. Finsbury. London. Eng.^d J. D. Sedding. Archt.

NOTWITHSTANDING the already long list of publications relating to house-drainage and plumbing, the appearance of a new book on this important subject always excites a certain interest. The book before us, moreover, small as it is, differs in character from the usual books treating of this subject. It is not a mere description of the many forms of pipes, traps and fixtures, and the manner of setting these and arranging the whole system in dwellings. Nor does it merely give in a concise form the usual rules on house-drainage. The book goes a step farther, inasmuch as it is a *critical review* of present plumbing methods and apparatus.

Some of the more serious defects of house-drainage have from time to time been alluded to by sanitary writers. They have been occasionally recognized and admitted by some plumbers and architects, and it may even be said that, at least in a few instances, manufacturers of plumbers' materials have acted upon the suggestions thrown out by such reformers. Yet, taken as a whole, our plumbing systems of to-day cannot be said to exhibit much vital progress compared with work done a few years ago. It is true that the radical defects and blunders of old-fashioned plumbing-work are now no longer incurred. The soil-pipes are always ventilated by extensions above the roof, the house-drain is trapped, a fresh-air inlet is provided at the foot of the house-drain for circulation of air, and to every fixture is attached a separate trap, and where the traps are of the usual S form, a back-air pipe is connected with the crown of the trap to prevent siphonage. Beyond these few general features little improvement is apparent. The common system of soil and waste pipes is rarely jointed in a gas and water-tight manner; most water-closets in use are objectionable in construction, flushing and manner of setting; wash-basins, sinks and tubs have more or less complicated appendages, and are not constructed on correct principles, particularly as regards their manner of discharge. Traps are often chosen of a complicated form, retaining filth, or else they are not of such a kind as to retain their water-seal under all circumstances.

Mr. Putnam calls attention in his book to all these defects, and it may be stated at the outset that he does so in a perfectly fair and impartial manner. Being much impressed with the value of the contents, we have read the volume twice from beginning to end, and we have found no statement of importance to which we should take exception. The intention of the author was to "make no statement which is not founded on facts recognized by all or easily demonstrated, nor to follow any course of reasoning which is not perfectly clear and logical." In this laudable endeavor he has succeeded admirably, and, after a careful reading of the pages, we have no hesitation in pronouncing the work one of value and of importance to architects, sanitary engineers, householders and plumbers, all of whom would derive profit from a study of the principles so clearly explained. Indeed, we have reasons to apprehend a wholesome reform in house-drainage, if the principles so ably set forth should become more generally accepted. The facts mentioned will, we trust, be a sufficient justification of the somewhat detailed review of the book.

Mr. Putnam frankly announces in the beginning of his lectures that the book contains, among other matter, the description of a number of new sanitary appliances, some of which have been patented to him. He states that "these devices are the outgrowth of a careful, practical study of plumbing made from the unprejudiced standpoint of the architect working for the interest of his client," and he adds that "they are the *result* and not the *cause* of the investigations." These statements, we presume, would suffice with narrow-minded persons, to cast suspicion upon the book. An unprejudiced reviewer, however, will soon be assured, after reading a few pages, that notwithstanding the fact that Mr. Putnam has some improved devices to offer to the public, the whole subject is treated without any bias whatever. At least, this is the conclusion to which we have come after an unusually careful perusal of the book, the reading of which is sure to afford, to all disinterested minds, as it did to us, much instruction and profit.

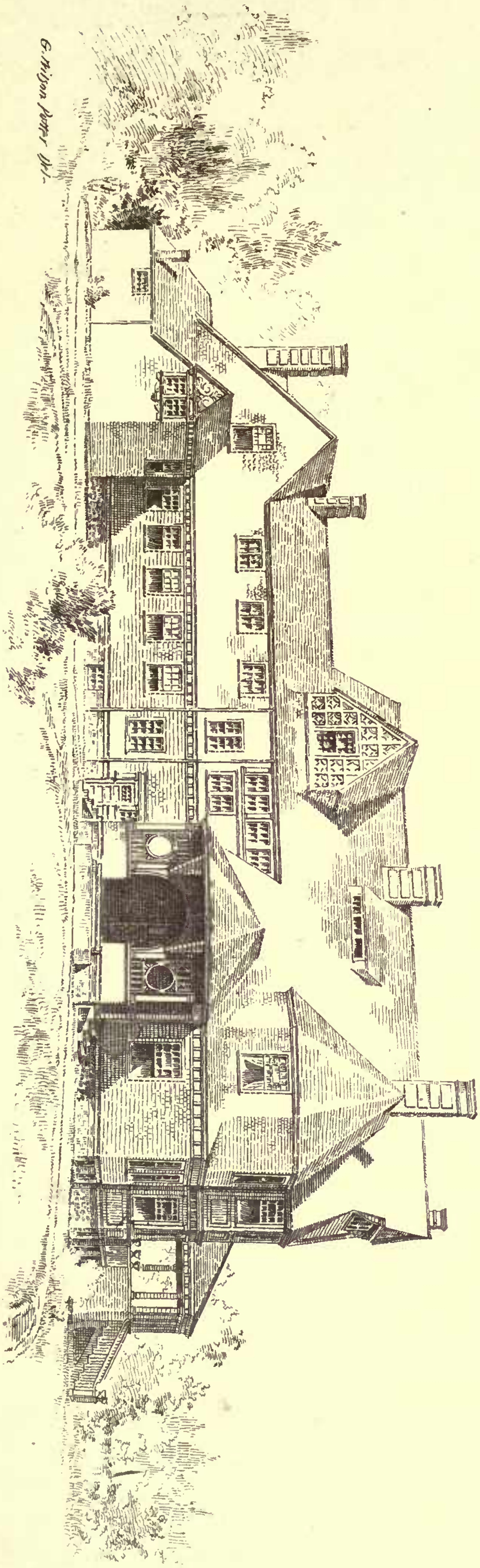
Thus much as regards our general impression of the book. Its contents are divided into three principal chapters, the first of which treats of traps, the second of plumbing fixtures, and the third of soil and waste pipes. In a general introduction Mr. Putnam points out that the architect and the sanitary engineer are the persons from whom radical improvements in plumbing may be expected, and commends the growing practice of architectural firms employing regularly a sanitary engineer to take charge, in coöperation with the architect, of the department of heating, ventilation and plumbing. A concise statement is next given of the leading principles which should govern the planning and construction of the plumbing work in all classes of buildings. The essential features, according to Mr. Putnam, are: simplicity, accessibility, avoidance of mechanical obstructions, tightness of joints, soundness of materials, ventilation, flushing, automatic operation, noiselessness, economy, and prevention of water-waste.

This classification of requirements may be unreservedly endorsed. It is only seldom, however, that we find them fulfilled and observed in practice. In the best plumbing-work of to-day simplicity of arrangement has given way to complexity and intricacy, and the result is a largely increased original cost, and heavy and frequent bills for subsequent repairing of the work. Worse than this is the unavoidably resulting insecurity of the plumbing. How rare, again, is it, even at the present day, to find a house with all supply and waste pipes in full sight, with fixtures openly arranged, and with every part of the plumbing fully accessible for inspection, repairs and cleansing. How seldom are the fixtures and traps of a house free from mechanical obstructions, such as flap-valves or hinged-pans in the closets, balls or valves in the traps. How rarely are the joints of a system of soil-pipes made permanently water and air tight, and free from leakages due to changes of temperature, settling of the house, shrinkage of floors, etc. How often do we find houses piped with brittle and flimsy cast-iron pipes of uneven and insufficient thickness, and with lead-supply and waste-pipes of insufficient strength adopted, to effect an unwise saving in the first cost of the work. How seldom is the principle observed that every plumbing-fixture should be constructed so that its discharge will have a powerful flushing effect upon the traps and waste-pipes, in order to remove completely and instantly all foul matters and kitchen grease delivered into waste-receptacles. How few water-closets in houses are arranged in a manner so as to be entirely noiseless in operation. How often is economy in construction sacrificed to mere outward notions of fashion or comfort, as for instance, by unduly scattering fixtures over all parts of a house, instead of arranging them in vertical clusters or groups. Finally, how rare it is to find any regard paid to the all-important consideration of water-waste prevention. With leaky faucets, ill-arranged valve-closets or hopper-cocks, service-pipes run on outside walls, without protection against freezing, no wonder that in our large cities the consumption

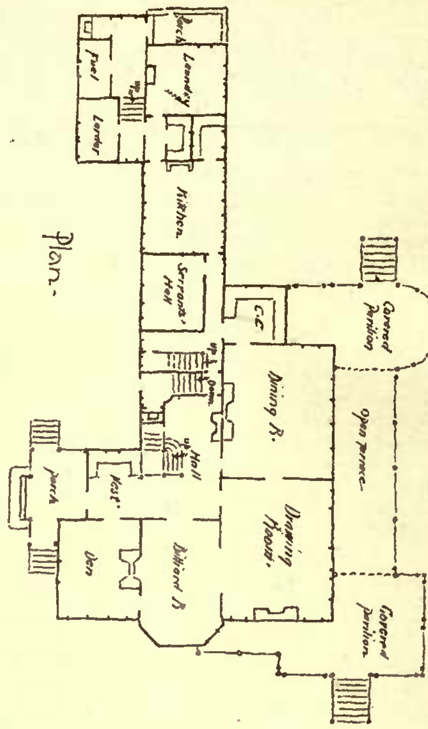
[1] From Cotman's "*Antiquities of Normandy.*"

[2] *Lectures on the Principles of House-Drainage*, delivered before the Suffolk District Medical Society (Section for Clinical Medicine, Path logy and Hygiene) and the Boston Society of Architects, at the Massachusetts Institute of Technology, by J. Pickering Putnam, Architect. Boston: Ticknor & Company, 1886. 1 vol., cloth. Price 75 cts.

No. 521 AMERICAN ARCHITECT AND BUILDING NEWS, DEC. 19 1885



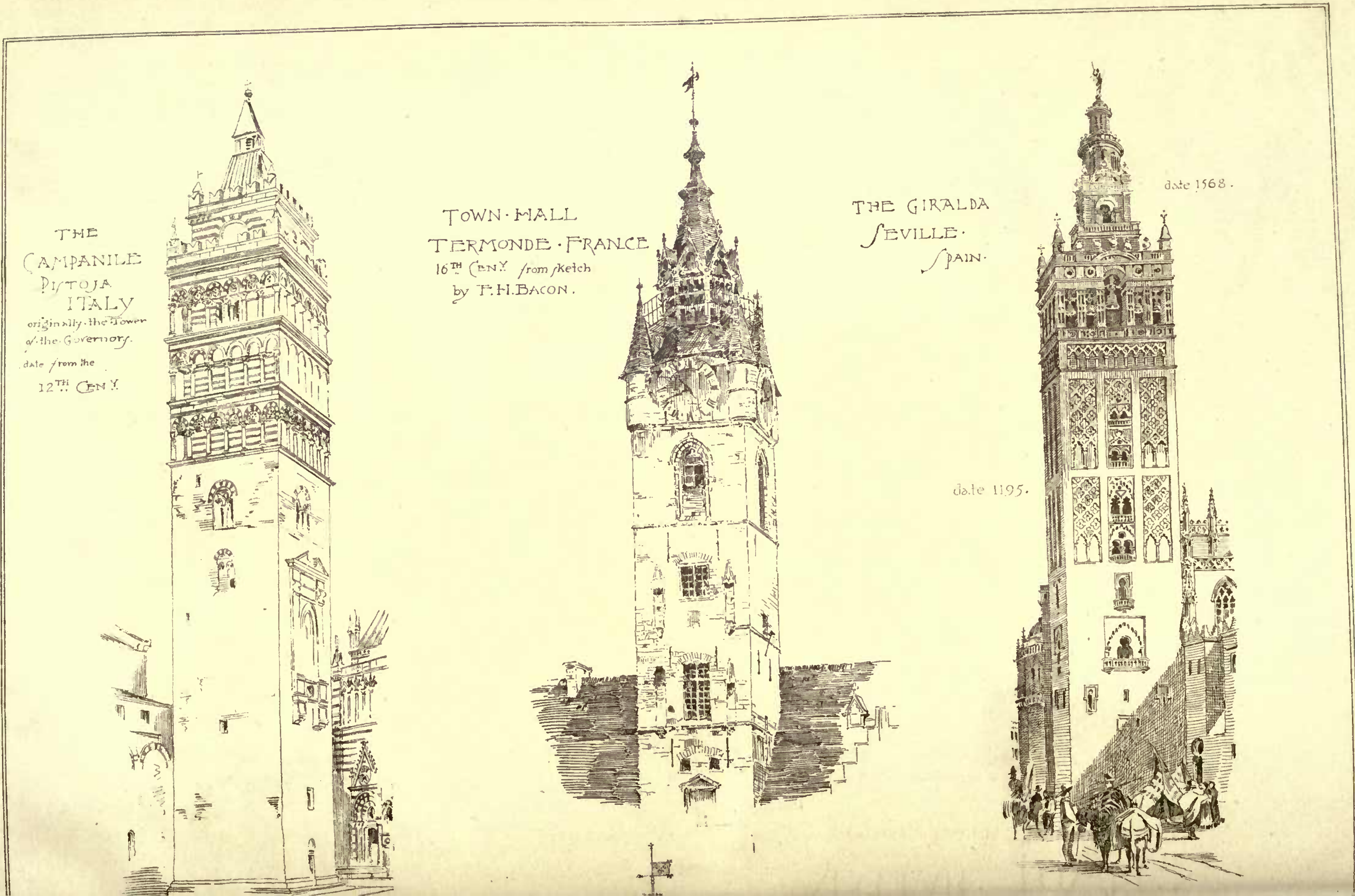
Plan.



COUNTRY HOUSE AT MARLBOROUGH · N.H.,
FOR GEO. B. CHASE ESQ.
Van Brunt and Howe Architects,
60 Devonshire St. Boston.

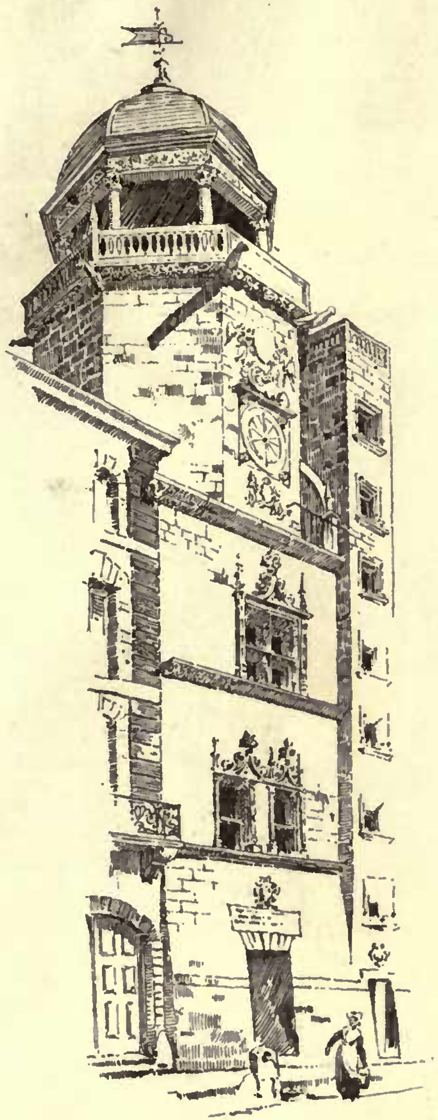
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American Architect and Building News, Dec. 19 1885



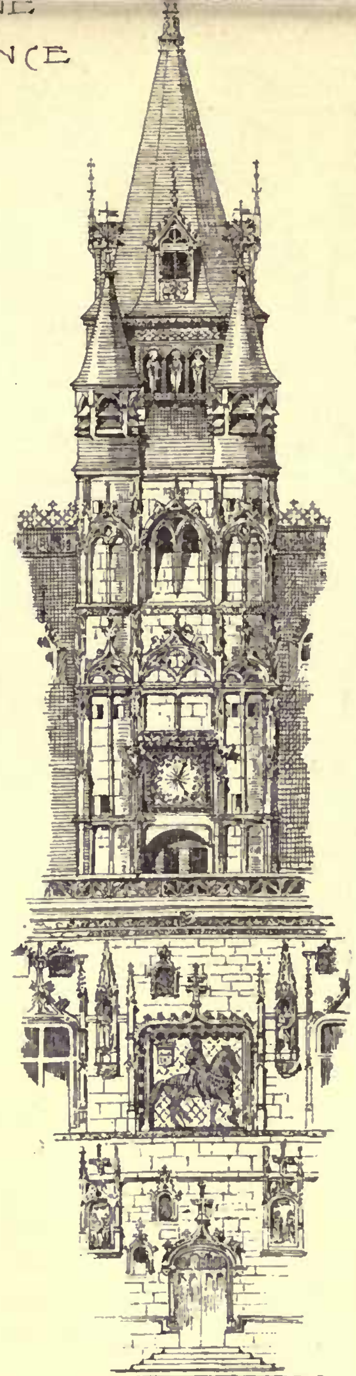
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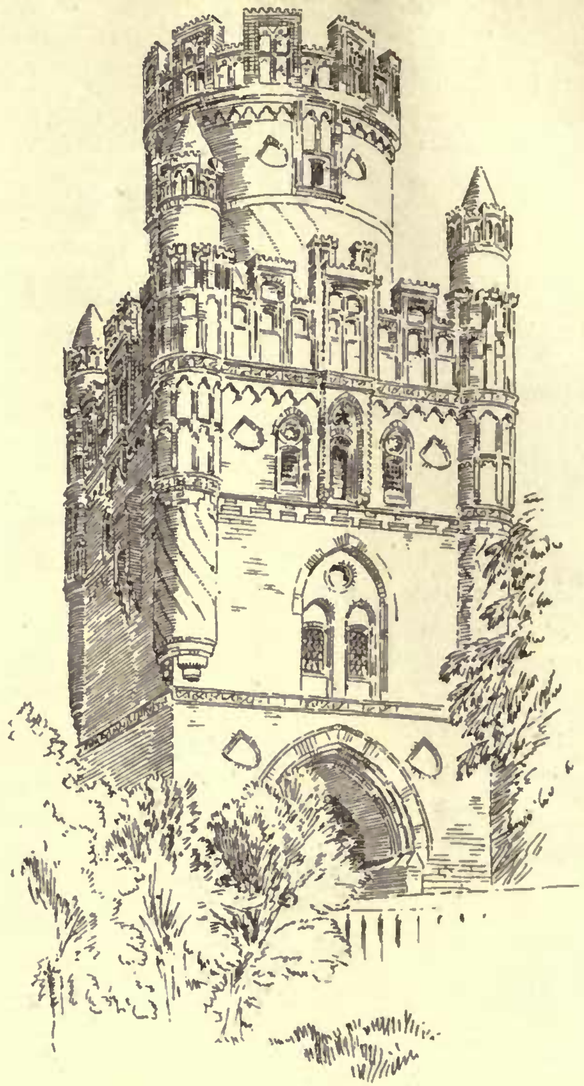
(MAINLY LATE MEDIÆVAL)



CLOCK · TOWER
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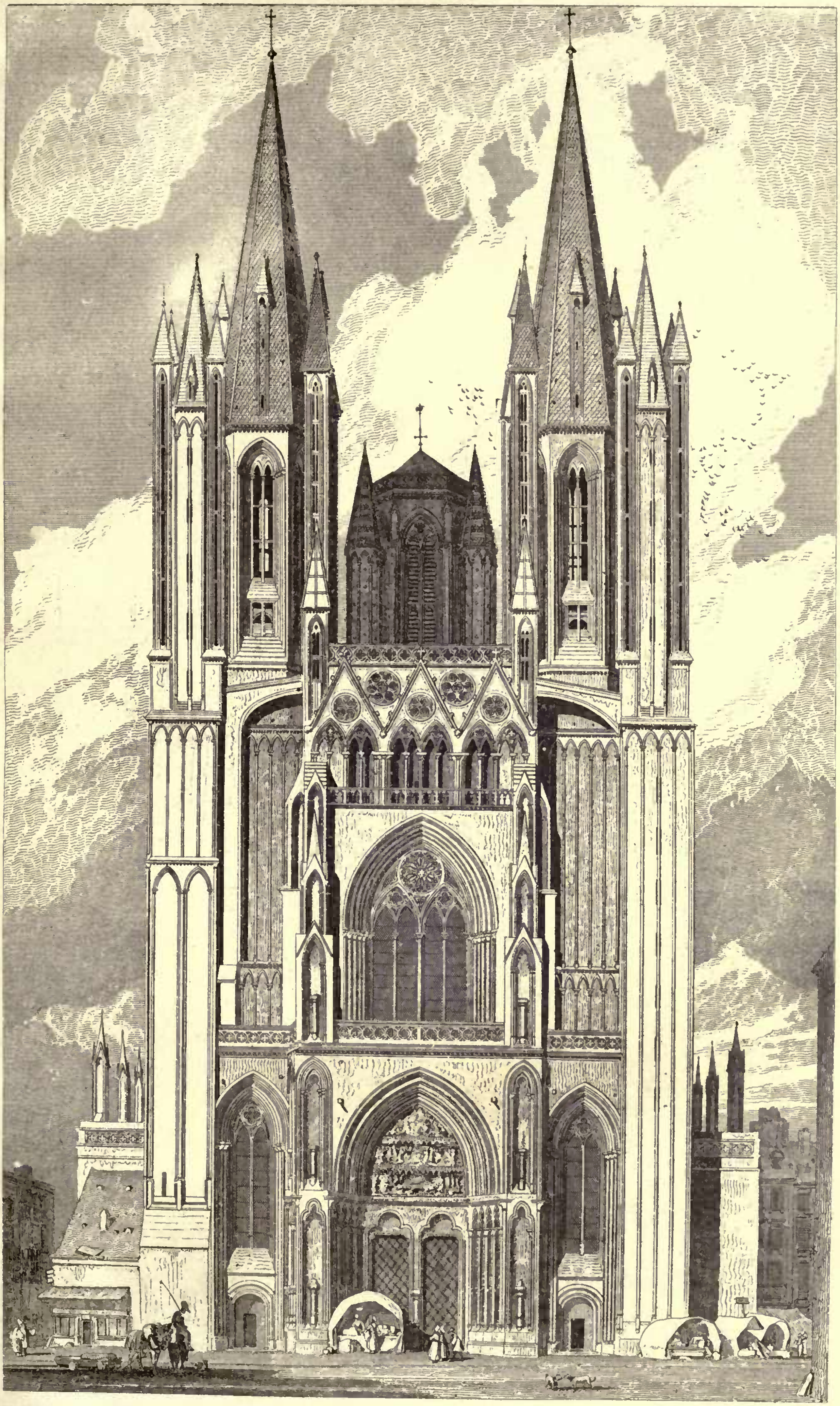
COMPIEGNE
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THE · INGLINGER · GATE
STENDAL . GERMANY.

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of water has reached such a height as to require the enactment of strict measures, such as the application of water-meters, or a house-to-house inspection, to detect and prevent the prevailing reckless waste of water.

Traps are discussed at length, and the causes clearly set forth which singly or conjointly tend to destroy their protecting water-seal. As one of the principal enemies to the security of traps the action of siphonage is explained, and the methods pointed out by which it may be prevented. The first method, and the one now almost universally recommended, and enforced by law in cities having plumbing regulations, is the venting of the traps by so-called "back-air" pipes. The second method consists in employing large reservoir traps, such as the pot-trap. The third method, and the one which Mr. Putnam recommends, is to use traps so shaped and constructed as to be both anti-siphonic and seal-retaining, yet at the same time self-cleansing.

Concerning trap-ventilation, the author justly states that it adds greatly to the cost and complication of the work. He adds that numerous and careful experiments have established the fact that trap-ventilation is not always efficient in preventing siphonage, while it is always more or less active in destroying the water-seal through evaporation. The second method involving the use of reservoir traps is characterized as inexpensive and simple, and much more efficient in resisting siphonic action than the first. It cannot, however, be recommended, since traps of this description are, one and all, miniature cesspools, retaining filth in the house and thus violating a cardinal rule of house-drainage. The third method is justly stated to be the simplest and least expensive of all. It is, moreover, more reliable and does not involve the objectionable retention of filth in the house. It requires, as a *conditio sine qua non*, the most thorough ventilation of all lines of soil and waste pipes, the use of branch waste-pipes restricted in length as much as possible, and a powerful flushing of traps and waste-pipes from correctly-constructed plumbing fixtures. It is explained that an abundant aëration of the short branch wastes may be secured both by diffusion of the air in the ventilated soil-pipe and by the influx of air, induced with, and after, the water-flushing at each use of the fixture.

The three methods briefly mentioned are carefully examined in detail. An apparatus used by the author in his lectures to test the efficiency of traps is illustrated, and a concise summary given of the experiments made. From these Mr. Putnam concludes that the disadvantages of trap-ventilation are as follows: —

1. It destroys the seal by evaporation when ordinary S-traps are used, with the vent-pipe taken from the crown.
2. It does not accomplish its object, and hence affords a false sense of security.
3. It increases the unscoured area of the trap, making it a cesspool.
4. It retards the outflow of the waste-water, owing to the friction of the air-current entering with the water during the discharge.
5. It renders the discharge noisy.
6. It complicates the plumbing, and adds to the danger of leakage through bad jointing and increased material.
7. It aggravates the danger arising from capillary attraction.
8. It seriously increases the cost of plumbing.

The author then shows how it is possible to construct a trap which will be anti-siphonic, yet self-cleansing. The various steps gone through before arriving at the final design are clearly explained and illustrated. The result is a trap, secure against back-pressure, evaporation, capillary attraction, self-siphonage and siphonic action, whose body resembles in outward appearance a small pot-trap placed horizontally, while it has in principle the self-scouring form of the S-trap.

Part II discusses plumbing fixtures. Speaking of wash-basins, Mr. Putnam correctly says that hitherto wash-basins and bath-tubs have been selected purely from a standpoint of convenience, appearance and economy, while sanitary considerations have been entirely overlooked. His criticisms are mainly directed against the size of the outlets of basins and tubs, which are too small in proportion to the size of waste-pipe and trap, with the result that both the trap and the pipe remain imperfectly flushed.

He condemns further all concealed overflow passages as liable to become fouled without the chance of cleansing through flushing action, and as being placed so that they cannot be reached. The use of the plug and chain device is also condemned as well as all concealed basin and bath-tub waste-valves. Mr. Putnam suggests instead a new form of wash-basin, with a large basin outlet, located at the rear part of the bowl, and having an independent, visible and accessible stand-pipe overflow. The basin is a radical departure from the ordinary forms, with many important advantages, and architects and sanitary engineers, whose duty it is to advise clients in regard to improved fixtures, would do well to study carefully Mr. Putnam's device. Similar improvements are suggested for bath-tubs and pantry sinks, and the use of a flush-pot recommended for kitchen sinks, in order to collect the usual trickling flow, and to dispose of grease by sudden and powerful flushing.

A sub-division of the second part treats of water-closets. Here too, we find Mr. Putnam's views in accord with those of all advanced sanitarians. After an unreserved condemnation of the pan-closet, he clearly explains the defects adhering to the modern valve and plunger closets, and shows why it is advisable to avoid all mechanical seal-closets. He is rather severe in his criticisms of the old style of hopper-closets, the long and short flushing-rim hopper, which have no large body of standing water in the bowl. Although we are prepared to admit the superiority of improved hopper-closets over such dry hoppers, yet we know of closets of the latter kind which give excellent satisfaction, and Mr. Putnam has probably had a similar experience, for, farther on in his book, in speaking of trough-closets and latrines, he recommends as a good substitute for the latter, a "row of good hopper-closets, with treadle, door, or seat-attachment for automatic flushing."

Several improved hopper-closets are illustrated and described, amongst others a very ingenious, yet simple, form, with automatic supply-pipe, devised by Mr. Putnam.

Of slop-hoppers and urinals, it is said that while they are necessary for hotels or large club-houses, railway-stations, etc., they are objectionable, and, therefore, should not be used in private houses, where a good hopper water-closet, set in an open manner without wooden enclosure, may take their place.

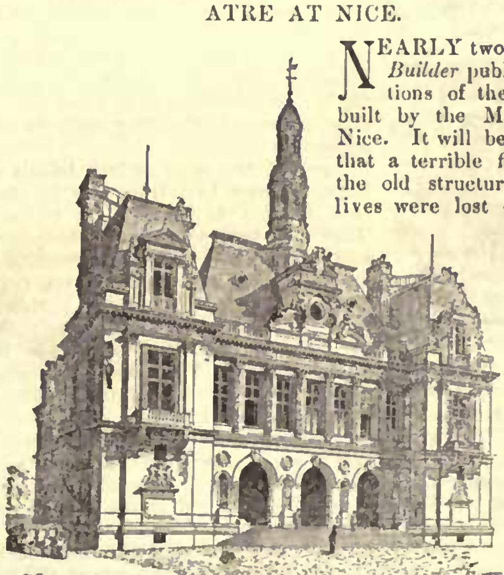
Part III of the book treats of soil and drain pipes. In the criticisms of the usual form of pipe and the manner of making pipe-joints, we find the same spirit of fairness and justice which characterizes the whole work. The defects of the ordinary hand-calked joint of bell-and-spigot pipes have long been recognized, and this has led to the substitution, in some recent work, of wrought-iron pipes for the usual cast-iron pipes, the pipes being used in greater length, with a corresponding reduction in the number of joints, and the pipes being jointed in the same manner as steam-pipes, *i. e.*, with air and water-tight screw-joints. Mr. Putnam offers a design of a new pipe-joint for cast-iron pipes and fittings, which may be broadly characterized as an adjustable flanged-joint with lead washers or gaskets for packing, the joint being made tight by compressing the pipe ends with bolts and nuts, screwed up with ratchet-wrenches. With this kind of pipe connections between lead waste-pipes, and the main soil-pipe system are made without the use of brass ferrules in a safe and much simpler manner.

Having described his improved soil-pipe joint, the author concludes this part of the subject by giving rules as to size and general arrangement of the piping. He contends that "the size of soil-pipes should not exceed four inches," a view eminently correct, but very seldom entertained by architects or builders. Farther on he says: "All the piping of a house should be in full view. Nothing should be walled in or covered over and rendered inaccessible. One of the first rules of modern sanitary work is to bring everything out of the darkness into light and air, where defects, if they occur, can at once be detected and removed. We are accustomed to running our steam-pipes in plain sight, and rendering them by gilding or silvering as ornamental as possible. The same custom is now beginning to apply to our plumbing pipes," to all of which we can give our most unqualified approbation. In conclusion, the peppermint and smoke tests are described, and their application to test the soundness of a system of house-drainage, recommended.

Many of the subjects referred to have been discussed by Mr. Putnam at length in an excellent series of articles on "Sanitary Plumbing," which appeared some time ago in the *American Architect*, but this new little book will be found very handy, inasmuch as it gives in a condensed form, the results of the author's original investigations. Mr. Putnam is already well and favorably known to the architectural profession by his large treatise on "*The Open Fire-place*," published several years ago, and it is to be hoped that his new book will meet with the same deserved appreciation.

THE VENTILATION OF THE NEW MUNICIPAL THEATRE AT NICE.

NEARLY two years ago the *Builder* published illustrations of the new theatre built by the Municipality of Nice. It will be remembered that a terrible fire destroyed the old structure, and many lives were lost on that occasion. In the article accompanying this illustration we had the pleasure of congratulating the architect, M. Aune, for the taste, skill and promptitude with which he had raised a magnificent new theatre almost as rapidly as the ashes of the old one were cleared away. But at the same time we lamented the absence of any scheme of ventilation. This was left to the accident of doors and windows, and we further pointed out



that in a town like Nice, where so large a proportion of the visitors are invalids, good ventilation in places of public resort was of more than usual importance. Finally we suggested that Nice might follow the example set by Geneva, where the Grand Theatre is a model of efficient ventilation.

All these remarks, we have been informed, were faithfully translated into French, and brought to the knowledge of the mayor and municipality. With commendable energy letters were at once written to the firm who had so successfully ventilated the theatre of Geneva, and whose work met with the approval of the Fourth International Congress of Hygiene, held at Geneva in September, 1884. Messrs. Geneste & Herscher were forthwith invited to Nice, and entrusted with the ventilation of the new theatre. The building was opened for the first time last season, and the result proved most satisfactory.

A few years ago the grand theatre of Vienna was the only establishment of the sort on the Continent which could be described as scientifically and successfully ventilated by the aid of a motive power yielding exactly the volume of air required. The comfort attained by such a method was so great that at Frankfort, Brussels, Geneva, and finally Nice, the example has been followed and in some respects improved upon. Remembering the suffocation endured in the old theatre of Nice, nothing could have been a greater and more agreeable surprise than the ease and fresh air enjoyed in the new structure. The ventilation is based on the principle that the air must not be supplied irregularly and from particular points, but should be admitted in horizontal layers, which, rising gradually from the entire surface of the floor, travel slowly up to the roof without occasioning any currents likely to disturb the spectators. But, further, the air must be so prepared as to be in a proper condition for breathing before it is admitted into the theatre. In other words, it must be warmed in winter and cooled in summer.

On visiting the theatre of Nice, we found that these conditions had been realized in the following manner. Over the entire surface, occupied by the stalls and the pit, the air is admitted by means of four hundred apertures. These are made under each chair and protected by iron gratings. They measure about six inches by ten inches. The openings therefore present a large surface evenly distributed; the air consequently travels slowly, in spite of its abundance. All these openings are fed by means of shafts into which the air is pumped by a mechanical ventilator. A small gas-engine suffices to put the fan or wheel into motion. In winter the air is previously warmed by a number of hot-water coils. Care is taken, however, not to allow any portion of this air to attain a temperature exceeding 62° to 65° Fahrenheit, and thus it does not lose any of the qualities of fresh air. There is in fact a mixing-room, where the warmed air is diluted with cold air that has not passed over the hot-water coils; and with a little personal superintendence it is easy to obtain precisely the required temperature. During the summer the air is cooled by means of a water pulverizer, which also adds a pleasant moisture to the atmosphere.

The theatre, it is important to note, is not warmed by the air pumped in for breathing purposes. If this were done, the air, to combat the refrigerating effects of the windows, walls, and other cold surfaces, would have to be heated to a higher degree than pleasant or wholesome for breathing purposes. All the parts surrounding the auditorium, the passages behind the boxes, vestibules, etc., are carefully warmed by hot-air flues.

The surrounding temperature is thus maintained at about 65° Fahrenheit. No system of ventilation is provided for this part of the house, nor, indeed, are there any special air-shafts to supply the boxes.

The ventilation is not so elaborate as at Vienna or Geneva; but, on the other hand, it is less complicated and not so expensive. For a theatre of moderate size the success achieved at Nice shows that it suffices if the entire floor of the house admit an up-current of air. This will ventilate sufficiently the front portion of the boxes, the part precisely where the spectators are sitting during the performance. By carefully separating the warming and the ventilating, the attendants remain master of the one and the other. More air or more heat can be supplied according to the necessities of the moment; but if the one could not be given without the other, very awkward difficulties might occasionally arise.

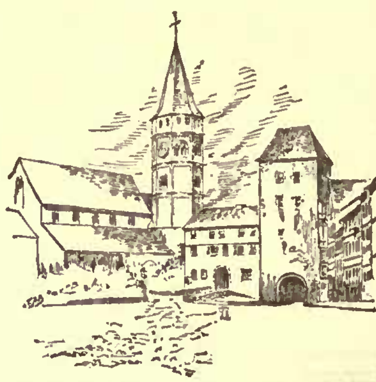
The theatre itself is illuminated by 727 gas-jets; but with the passages, crush-room, etc., we have a total of 1,700 gas-burners. During the representation, for instance, of "Faust," 78½ cubic metres of gas were burned per hour; and as the entertainment lasted from half-past seven to half-past twelve in the night, 393 cubic metres of gas were consumed. The gas required for the engine, which is only of six-horse power, amounts to one cubic metre per horse-power per hour. The ventilating-fan generally pumps 14,000 cubic metres of air into the theatre per hour during the winter, and 18,000 cubic metres in the summer. As there are 1,500 seats in the theatre, this would amount to nine cubic metres per head per hour in winter, and twelve cubic metres in the summer. We must also allow for the fact that every seat is not always occupied, and there is a certain amount of accidental and supplementary ventilation due to the opening of doors, windows, etc. To prevent this accidental ventilation becoming in any way unpleasant, care is taken that the passages and outer rooms should always be two or three degrees warmer than the theatre; thus any current caused by the sudden opening of one or more doors is always a warm, and therefore not an unpleasant current.

The observations made during various performances show that on an average the temperature of the stalls and pit is equal to 63° or 64° Fahrenheit during the whole evening. In the gallery the temperature is the same during the first hour, but during the second hour it rises to 65° Fahrenheit, and towards the end of the performance it may go as high as 67° or 69° Fahrenheit. At the same time the passages, vestibule and various annexes had a temperature varying from 65° to 67° Fahrenheit. The fresh air coming into the theatre underneath the chairs in the floor of the house travels at the rate of 15 to 18 centimetres per second, according to the atmospheric pressure and the amount of gas burning at the time. In summer the speed increases to 20 or even 25 centimetres per second, but the current is so evenly diffused that it is not felt by the spectators.

Under these circumstances the beauties of the new theatre can be enjoyed without any inconvenience. There need be no fear of taking cold, or of enduring the pain of a "theatre headache." For a health-resort like Nice such advantages, we repeat, are of the greatest importance, and will not fail to attract people to the town and augment the receipts of the theatre.

In the decoration and ornamentation of the theatre, which were not complete when we described its main architectural features, a great deal has also been done to attract the admiration of visitors. The staircases and vestibules are most capacious and highly ornamented. Two handsome statues representing female forms holding up lamps at the foot of the principal flight of stairs are due to J. Coutant, who won the competition for the Jeu de Paume de Versailles and the Gambetta statues. In the crush-room there are some fine paintings representing views of Nice and the Bay des Anges, with angelic nudes bathing and rising from the foam of the blue waves. These paintings are by M. Costa, a native artist; but for the scenery and stage machinery it was necessary to employ Messrs. Diosse, of Lyons and Geneva. Altogether, what with the painting, the sculpture, the decorations, the white stone and the red columns of Verona marble, the ample space, the broad passages, majestic staircases, and, above all, the fresh, pure air supplied in such abundance, even in the hottest weather, the theatre of Nice may be considered one of the most attractive places of entertainment of Europe. It remains to be seen whether in the selection of his performers and performances the *impressario* will prove himself equal to the exceptional advantages afforded in this model theatre. In all cases the architect, M. Aune, and the ventilating engineers, Messrs. Geneste & Herscher, have most fully and satisfactorily fulfilled the difficult and important task with which they are entrusted.—*The Builder.*

THE FOREST SUPPLY IN THE UNITED STATES.



THE prolific growth of timber trees in the United States, and the vast extent of their forests, induced customs and methods of construction among the earlier settlers which have resulted in the extravagant use of timber for all purposes, and systems of timber cutting without any attention to the renewal of forest growth, which bid fair to result in great embarrassment to the lumber trade.

Within the last twenty-five years, the price of white pine at the sea-coast has trebled, and that of hemlock doubled. At the present rate of consumption there is about eleven years' supply of white pine now standing in the Northern States comprised in the area bounded by the Atlantic Ocean on the east, the Dominion of Canada on the north, the upper portion of the Mississippi River on the west, and the Ohio and the Potomac Rivers on the south.

In the Southern States the estimated supply of the long-leaved pine (*pinus australis*) is sufficient for many years, but much of it grows at a distance from navigable rivers and railway lines, and the supply convenient to lines of transportation has become so reduced that there is a scarcity of this timber for millwork and shipbuilding.

The railways of the country annually require about 60,000,000 ties, or the product of 500 to 600 square miles of growth of such timber, and at places convenient to their lines. In Canada, the annual cutting amounts to 2,000,000,000 feet, board measure; and in the United States, according to their last census, the cutting there amounts to 224,000,000 feet, board measure.

It is considered that the resources of the soil would be adequate to replace this immense drain upon its production of the consumption of timber if care was taken to foster the new growth of forests and if forest fires could be checked. The ravages of forest fires result in the destruction of greater values than the losses of buildings by fire. The subject has been forced upon the consideration of the people and the question of its remedy is receiving serious attention, but the most judicious plans lack the co-operation of those engaged in timber-cutting until the supply in that immediate locality becomes nearly exhausted.

The results of such efforts are shown in the statute laws of the

legislature of the several States composing the United States. In this connection it may be said that while the Congress of the Federal Government enacts laws of a national character, each of the several States exercises local self-government, subservient to the general government through laws passed by their legislatures; and this question of tree-preservation comes within the scope of the State authorities.

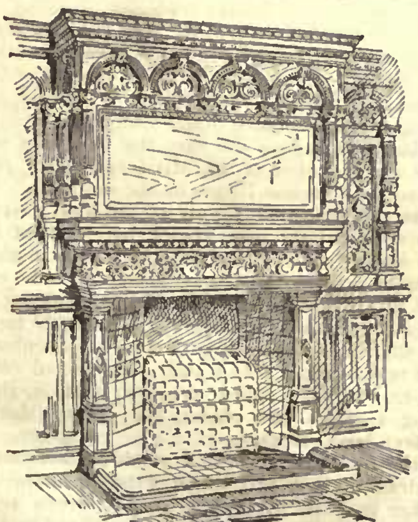
Seven of the States have no legislation on the subject. Kansas repealed such a law, and Texas enacted a law giving to railway corporations the right to enter upon any land along their line and cut timber for constructive purposes; a law which can be understood when it is considered that only a small portion of its immense area has been occupied by actual settlers, and the enactment is a portion of the legislation designed for the promotion of railway construction as an efficient means for encouraging immigration into that State.

The laws in the remaining States for the furtherance of tree culture are of two classes. Nineteen States are provided with protective laws which defend the owners of trees against acts of injury by providing fixed and excessive penalties for all acts against trees, and thus relieving the owner of the excessive burden of proof of value of the damage, etc., which would be necessary if in the absence of such statute law, he was obliged to limit his course of action to a proceeding under the common law, governed by the same principles of just remedy for a wrong common to all Anglo-Saxon people.

In the remaining seventeen States these protective laws are still further reinforced by subsidizing laws which in addition to the special legislation for the defence against wrong-doers, also grant various bounties and immunities to those who plant trees. Most of these laws show an intelligent appreciation of the subject, although in some States there are limiting conditions which restrain the application of such favors, and gives rise to a presumption that the Bill was drawn up by an enthusiast and amended by a practical politician; as, for example, in Rhode Island, where plantations of forest trees numbering 2000 to the acre, are exempted from taxation for fifteen years after the trees have reached a height of four feet, but this applies to land worth less than twenty-five dollars per acre. Now this State has a population of two hundred and eighty to the square mile, distributed in factory villages on fertile land around the water-courses which cannot reach the sea except through the water-wheels of the numerous small mills scattered over the State, and any land in that State valued within the statute limit, must be too sterile to sustain a tree for every twenty-two square feet of area.

California requires certain county officers to encourage the planting of trees along the highways and give one dollar bounty for every living tree four years old. The laws of Michigan, Massachusetts, Nebraska, New Hampshire, New York, and Wisconsin contain wise provision for the encouragement of tree-planting along the highways, on the principle that the result of such action is twofold, for in addition to the benefit accruing to the highway and the abutting property, it has an inevitable tendency to encourage tree-planting elsewhere. The remaining States further this result either by payment of money premiums or abatement of taxation, or both. In some States it is the custom of the governor to issue a proclamation once a year decreeing a public holiday for the purpose of tree-planting along the highways. The presentation of facts showing the alarming diminution of the standing forests, by the Census Bureau and other official sources, and the continual action of associations organized for this purpose, is resulting in measures tending to check the destruction of forests. — *Engineering.*

STATISTICS OF SEWAGE-FARMS.



Mantel in Cabin of Mr. A.B. Walker's Yacht : George & Peto Archts Lond: Eng.

A FEW useful figures are given in the work of Mr. Lewis D'A. Jackson, lately published, respecting the systems of irrigations that have been put into operation in this country. A general tabular statement of the nine sewage-farms competing in 1879 based on the judges' report affords much useful information. We here furnish a few data. The number of acres irrigated at Aldershot is ninety-nine, which takes the supply of sewage from 8,000 persons, or, at the rate of seventy-seven persons to an acre. The average daily supply was, then, 28,000 cubic feet. There is no lift. The land irrigated is of a light sandy character, and the subsoil is ferruginous gravel. One of the chief disadvantages is the want of storm outlets. The whole of the sewage from the Camp passes on to the farm, the effluent is said to be clear, bright and inoffensive. The treatment adopted consists in collecting the sewage in subsidence tanks of small size on the farm, from which the liquid matter alone is allowed to flow direct on to the land. The sludge tanks are formed of earthen banks coated with gravel and tar, and these receive the solid matter at a lower level. Their dimensions are one hundred and eleven feet by twenty-one feet by two-and-one-half feet. The sludge is allowed to consolidate in them, and at certain seasons is carted on to the land — the liquid runs in earth carriers, the land being divided into two-acre plots, subdivided by subsidiary carriers.

Parts of the land are drained to a depth of four feet to six feet; the drains being thirty to sixty feet apart. More drains are considered to be necessary, especially during floods. Crops of all kinds have been successfully grown on the farm. Bedford has an irrigated area of one hundred and fifty-three acres, and the sewage represents 18,690 persons, or one hundred and two persons per acre. The average daily supply of sewage is 152,000 cubic feet; it is lifted twenty-one feet and thirteen feet. The soil is light sand and loam, but the local disadvantage is stated to be that the sewers are liable to flooding from the Ouse. The whole of the sewage of the borough is collected at the pumping-station, the solids are there screened, and a storm overflow provided. At other times the pumps lift the sewage to a height of thirteen feet for one hundred and twenty-three acres, and to twenty-one feet for 30.25 acres. At night the sewage is stored in the sewers; the screened sewage is pumped through an eighteen-inch iron main pipe; the carriers are earthenware pipes eighteen inches to nine inches diameter, laid in banks above surface of the land; the distributors are earth-cut channels ploughed or dug from time to time as required. The solids are also used on the land. The under-drainage is by two-inch pipes, three feet deep in parts, and deep ditches round the fields. The crops grown are various, and the average value per acre of Italian rye grass is £7.66, permanent pasture, £6.37. Of root crops, parsnips show a yield valued at £20, potatoes, £16.84, and onions, £33.28. There is a large yield of celery amounting to £36 an acre. These yields were those of 1878. Wrexham has an irrigated area of 100.7 acres, representing the supply of sewage from 10,000 persons, or ninety-six persons per acre of farm. The daily supply is 48,000 to 80,000 cubic feet, no lift, and the soil is sandy and peaty, with a subsoil of gravel and sand.

As many of our readers know, Col. Jones is the manager; the sewage of Wrexham flows into settling tanks at the top of farm, and the liquid is allowed to flow on to the land in earth-cut carriers. In excess of 80,200 cubic feet of liquid, the wet-weather supply passes into a brook by storm overflows. The solid matter is removed, dried by a fan, and sifted, afterwards made into artificial manure with bone-dust and sulphate of ammonia, and sold or used direct on the land. About three hundred tons of dry sludge is annually removed. The under-drainage of land is by eight-inch, and six-inch pipes, six feet deep, and one hundred and twenty feet apart, though in wet places more pipes are laid three-and-one-half feet deep; little surface effluent passes off the farm. The rotation of crops is rye grass for three years, fourth year cereals, fifth year mangolds.

Among the large farms we note Birmingham with an irrigated area of 252.91 acres from a population of 112,500, or four hundred and forty-four persons per acre of farm; a daily supply of 481,000 cubic feet of sewage, which flows on the land, which is of a light peaty and stiff clayey nature, with gravel subsoil, liable to flooding. One part of the land receives pure sewage, another part unprecipitated sewage mixed with lime, and the remainder the effluent sewage after subsidence. Earth-cut carriers are used. The three settling tanks, three hundred and ninety feet by ninety feet by five-and-and-half feet, at the outfall are used alternately for a fortnight, while the sludge is removed. There are sixteen small settling-tanks, into which mere sludge deposits, the effluent sewage flowing off on the land. The sludge is treated (1) as semi-fluid sludge, which is pumped up and pushed on to the land in elevated wooden troughs by poles, and (2) heavy matter, consisting chiefly of road drift. About five hundred tons of moist sludge are raised daily. The land is prepared by raising small embankments, and then dividing it into a series of small tanks. After the sludge is consolidated in these to a depth of a foot, it is dug into the land to a depth of two feet. The cost of preparing the land and digging is £12 an acre. The judges say the sludge appears not to amalgamate with the soil, and remains a mass of worthless fibrous matter for at least two years, when it is ploughed. The under-drains are six feet deep, and thirty-three feet apart, the effluents are clear, and the chief crops are rye grass, mangolds and cabbages.

Croydon has an irrigated area of three hundred and twenty acres, a population represented of 55,000 or one hundred and twenty-one persons per acre; a supply of 1,233,000 cubic feet daily, flowing on the land, which is of light peat and gravel, with a subsoil of yellow marl and gravel, but liable to excess of subsoil water. The rainfall is separated, and the sewage is conveyed in two outfall sewers; the solid mater is extracted on Mr. Baldwin Latham's plan, and the liquid is distributed in earth-carriers. Our readers are pretty well acquainted with this farm. The farms of Doncaster, Leamington, and Reading are also tabulated. Leamington is a well-managed farm, and is profitable, the only disadvantage being the high lift, one hundred and thirty-two feet. The soil is sand, with gravel subsoil, and the sewage is conveyed to it after the solid matter is partly removed, by earth-cut trenches and carriers.—*Building News.*

CHARCOAL TIN.

New York, N. Y.

To the Editors of the American Architect: —

Dear Sirs, — Will you please inform me of the difference between quality of tin in common use on buildings. We have been accustomed to call for I. C. *charcoal* tin to distinguish it from *coke* tin.

Is it necessary to add the word "charcoal," or is it sufficient to call for I. C. tin simply, to get the best made by the charcoal process?

Yours truly, I. C. Charcoal Tin.

[I. C. charcoal tin means simply a light quality of charcoal plate, Charcoal plate is more flexible than coke plate, and makes better joints in roofing.—Eds. American Architect.]

BOOK ON FIRE-PROOF CONSTRUCTION.

Minneapolis, Minn.

To the Editors of the American Architect: —

Dear Sirs, — Will you be kind enough to inform me of the name of the best work on "Fire-proof Construction," both of iron and terra-cotta; also prepared materials, such as preparations applied to wood, etc. I want the "work" (if there be such a one) to give the strength of the materials, as the weight a certain-sized iron column will sustain, also iron beams; and the latest and best methods of coupling, etc.; in other words, a "comprehensive digest of fire-proof construction." I want to order such a book, and thought you would post me of the name and price, etc. An early reply will oblige,

Yours very truly, W. D. Kimball, Architect.

[Kidder's "*Architect's and Builder's Pocket-book,*" published by John Wiley & Sons, Astor Pl., New York, price $3.00, gives most of the information desired.—Eds. American Architect.]

NOTES AND CLIPPINGS.

Restoration of a St. Eleanor's Cross. — Queen Eleanor's cross at Waltham is to be restored. It was designed by Pietro Cavallini in 1291 and finished in 1294. It is in memory of the consort of Edward I., who accompanied her husband to Palestine and sucked the poison from a dagger wound in his arm. She was the mother of the first English Prince of Wales.

The Old State House at New Haven, Conn. — A New Haven committee appointed to look after the old State House have decided against appropriating $25,000 to repair it, and recommend that it be demolished. This brings a protest from Prof. W. P. Trowbridge, of Columbia College, who considers the building undoubtedly the most noted exemplification of Greek architecture on a grand scale in this country.

Painting Icons.— The painting of religious icons is an industry of the kustar in many governments. In the district of Bogorodsk — Moscow government — such occupation is conducted in thirty-seven homes and seventy-one kustars are constantly engaged. The yearly output of icons from this region is about 9,000 — which are mostly ordered — valued at from 13,050 to 17,400 rubles ($6,525 to $8,700). In the execution of such work the icons are divided into two groups — single saints and multiple saints. A kuster can execute three icons containing single figures in a week, the sale price for which is one ruble (fifty cents) each; total, three rubles ($1.50); the expenses in connection with the same being two rubles, eight copecks ($1.04), leave a remuneration of ninety-two copecks (46 cents). However, should the icon painter be in a position to purchase at once the material necessary for painting sixty icons at an outlay of thirty-seven rubles, ninety-three copecks ($18.96½); if he paints icons in which there are more than one figure the average cost of production does not exceed sixty-three copecks (31½ cents). The sale price being two rubles ($1.00) for such works, his receipts from such occupation will be one ruble, fifty-one copecks (75½ cents) for his week's labor.—*St. Petersburg Consular Report.*

The "Vulgarization" of Oxford.—William Morris writes to the London *Daily News* as follows: "I have just read your too true article on the vulgarization of Oxford, and I wish to ask if it is too late to appeal to the mercy of the 'dons' to spare the few specimens of ancient town architecture which they have not yet had time to destroy, such, for example, as the little plaster houses in front of Trinity College or the beautiful houses left on the north side of Holywell Street. These are in their way as important as the more majestic buildings to which all the world makes pilgrimage. Oxford, thirty years ago, when I first knew it, was full of these treasures; but Oxford 'culture,' cynically contemptuous of the knowledge which it does not know, and steeped to the lips in the commercialism of the day, has made a clean sweep of most of them; but those that are left are of infinite value, and still give some character above that of Victoria Street or Bayswater to modern Oxford. Is it impossible, sir, to make the authorities at Oxford, town and gown, see this, and stop the destruction? The present theory of the use to which Oxford should be put, appears to be that it should be used as a huge upper public school for fitting lads of the upper and middle class for their laborious future of living on other people's labor. For my part I do not think this a lofty conception of the function of a university; but if it be the only admissible one nowadays, it is at least clear that it does not need the history and art of our forefathers which Oxford still holds to develop it. London, Manchester, Birmingham, or perhaps a rising city of Australia, would be a fitter place for the experiment, which it seems to me is too rough a one for Oxford. In sober truth, what specialty has Oxford if it is not the genius loci which our modern commercial dons are doing their best to destroy?"

A New Cure for an Old Complaint.—Mr. Robert Garrett is building a portico over his new house in Mount Vernon Place, Baltimore. Mr. Henry Janes, who occupies the adjoining house, objected to the portico on the ground that it shut off his light. Accordingly he applied for a mandamus requiring Mr. Garrett to tear it down. This mandamus was granted, whereupon Mr. Garrett took the case to the court of appeals, where it is now pending. On Wednesday it was rumored that Mr. Janes had discovered a way to wreak summary vengeance upon Mr. Garrett in case the court of appeals decided that the portico could stay where it is. He had decided, if the portico was not torn down, to present his house and grounds to a colored orphan asylum. This threat to establish such an institution in Mount Vernon Place aroused the property-holders to a high pitch of indignation.—*Commercial Advertiser.*

To Clarify London Sewage. — The disposal of metropolitan sewage has long been one of the problems which have exercised the best engineering and sanitary talent of the day. In June of 1882 Sir William Harcourt deemed it necessary to recommend the appointment of a royal commission to inquire into and report upon the subject, but beyond the closing of the inquiry, and the completion of the report, no apparent steps have been taken toward the providing of a remedy for the most undesirable condition of things with which the dwellers in London are continually brought face to face. Lieutenant-Colonel A. S. Jones and Mr. Bailey-Denton have now memorialized Sir Richard Cross, reminding the right honorable gentleman at the outset that no substantial effort has been made to give practical effect to the recommendations of the commission, although their report was submitted six months ago. The design of the memorialists embraces the extension of the outfall sewer to Canvey Island. Sir Joseph Bazalgette, it will be remembered, proposed that the outfall should be at Thames Haven, which is separated from Canvey Island by Hole Haven Creek. It is premised that a good and practicable scheme for the clarification of the sewage at the point of outfall might be devised. By extending the sewer to Canvey Island, instead of discharging the sewage directly into the river, it is assumed that the process of treatment would be greatly facilitated. The memorialists propose that the sewer should deliver at a height equal to that of the banks or walls by which Canvey Island is surrounded (about ten feet above ordinary high tides). The purpose for which these banks exist is to prevent the flooding of the island by outside tidal water. To effect the clarification of the sewage upon the island inside the banks, it is proposed to have recourse to mechanical deposition and chemical precipitation whereby the solid portions may be separated from the liquid, and subsequently to apply the liquid to land by way of filtration or irrigation, separately or in combination, whereby the effluent will be brought to such a condition as will render it perfectly admissible into any tidal waters. It is intended to convert the extracted solid or fertilizing portions of the sewage into a salable manure, as far as it will be profitable to do so, or by mixture with soil to bury the sludge. Failing profitable or advantageous use, an alternative process would be the burning of the perishable or organic matter. It is pointed out that Canvey Island contains about four thousand acres — surely a sufficient area for the practical accomplishment of the scheme, if space is a desideratum. There are ways and means, however, of adding twelve hundred acres to the island at a comparatively small outlay. The proximity of the island to South Benfleet, where there exists a station on the London, Tilbury and South-End Railway, will facilitate the construction of a tramway to and across the island for the transmission of produce, and materials by land, while the frontage of the island to the river will afford access by water. The surface of the island within its banks is one general level, with only such hollows and gutters in its configuration as have been naturally formed by the off-flow of surface-water. The height of the land is from eight feet to nine feet above ordnance datum, while the surrounding banks have been raised about nine feet higher, so that there physically exists within the island, between the surface of the land and the top of the inclosing banks, a ready-made basin capable of holding, without overflow, about 10,000,000,000 gallons of liquids. It is not anticipated, however, that this capability will ever be utilized. The present quantity of dry-weather sewage daily discharged from the metropolis has been taken by the Royal Commissioners to be 150,000,000 gallons, while the future dry-weather discharge has been estimated by certain authorities as likely to reach 200,000,000 gallons. There exists, therefore, within the island, space sufficient to hold for two months the present dry-weather sewage of London, without overflow and without calling into requisition the absorbent powers of the soil upon which the liquid sewage would rest, and which, with well devised underdrainage, would be very effective for infiltration. An area of from seventy to eighty acres within the banks is capable of receiving a day's discharge of sewage without overflow. These are the leading features of the scheme. It may be added that the memorialists assume a sufficiency of space on the island to receive and clarify the sewage of the metropolis for a century to come, after making all allowances for the gradual reduction of area. Whatever the intrinsic or relative merits of the plan, the urgency of providing a solution for this mighty problem should at all events insure it a respectful reception and a careful assessment of its claims. Something yet remains to be said on the financial aspect of the question. Lieutenant-Colonel Jones and Mr. Bailey-Denton have already secured more than three-fourths of the island. To facilitate the raising of the capital for its purchase without resort to speculative means, they propose that the various properties in the island shall, as they are purchased, be conveyed at once to the Metropolitan Board, and that bonds of subsidy for a fixed proportionate amount shall then be handed over to trustees. The latter are, it is suggested, to be jointly selected by the Metropolitan Board of Works and the memorialists, with the understanding that such bonds shall be converted into money to be laid out in the purchase of the land and in the payment for permanent works, including the necessary legal and engineering charges. The whole of the bonds so advanced shall not, it is stipulated, exceed three-fourths of the subsidy — *i. e.*, £66,000 a year, leaving two-fifths of the subsidy, or £44,000 a year, to meet the current working expenses after the completion of the permanent works. — *Liverpool Daily Post.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

TRADE SURVEYS.

IF it were possible to specify in a line or two the character of next year's building operations, it might be said that they will cover three kinds of work — house building, public building and street improvements. It is too soon to anticipate fully the volume or character of next year's business. Extensive street improvements have already been determined upon in New York, Philadelphia, and Chicago, and in a large number of towns, of from ten to one hundred thousand inhabitants, house-building has made street improvements a necessity. Municipal authorities are forced by public opinion to deal more liberally in the matter of well-paved streets. The dealers in street-building material have been already consulted in numerous cases, as to supplies, prices, deliveries, etc., and they give, therefore, a rather encouraging statement as to what they expect to do during the coming year. The construction of a thousand or two miles of streets will give quite a stimulus to the material market, and reflect no small degree of activity in a variety of side industries that will be called upon to furnish material of one kind or another for that purpose. The municipal authorities are already preparing to expend money liberally in the erection of public buildings. In connection with this activity, electric-lighting companies are deeply interested, and have already been called upon for estimates in many cases for plants and appliances for the production and use of electric lighting. These companies are not, as yet, competing very actively with each other, and are, therefore, expecting to realize liberal margins. Several systems are before the public, all of which are pretty well understood. There is room for improvement in each of the various systems, but sufficient progress has been made to justify the public and its care-takers in municipal bodies in placing contracts for use of the improved systems of lighting. The manufacturers of hardware, nails, lumber, brick, and building material generally, including iron and steel, are satisfied with the present outlook, though they regret that the upward tendency in prices will likely be arrested before the desired improvement in prices has taken place. The enumeration of the new buildings already projected is sufficient to satisfy architects and builders and manufacturers of material that the coming year will bring with it better prices, unless some unforseen cause should arise to obstruct the improvement asserting itself in a quiet way. The iron and steel making establishments of the country are sold up most of them into midwinter, and with the prosecution of projected railway enterprises, an incentive to greater production in outside industries will be greatly stimulated. The disposition is manifested everywhere to increase production in a moderate way. Raw material is advancing, in tendency, at least, if not in price. It remains with the manufacturers in all the various industries to protect their interests by conservative management. Prices can improve ten per cent. and will, if manufacturers do not forget themselves and disregard the experience of the past two or three years. Building enterprises of great magnitude will be undertaken, if nothing more unfavorable takes place than has already manifested itself. The construction of Eads's ship-railway is among the possibilities of the next few years. The construction of four or five thousand miles of long lines of railroad will, no doubt, be undertaken within ninety days after the corner in railway affairs has been turned. The manufacturers of all kinds of wares, machinery, and shop products generally, have been more encouraged during the past year with reference to the possibilities of an export trade than they have been during our entire previous history. Our export trade has very intimate connection with our building interests. It is impossible to predict what there is in trade with foreign countries, but whatever advantage is to be secured will be worked out with vigor by American enterprise, even without the advantages which nations competing with us possess. Our manufacturers have taken too much for granted, with reference to the advantages which other nations possess over us in seeking for the trade of the world. The list of machines and machinery, which is now preferred by foreign users of machinery, would be a surprising one if made. It covers one hundred articles, from locomotives down to show-cases, printing material, lithographic work, paper, hosiery, and a long list of articles, the export of which is not so much as suspected by the general public. American enterprise is overcoming obstacles which cheap foreign labor is presenting, and is now forcing the products of American shops into use, against the whole established reputation of Old Country houses. Special reference is made to this fact, because of its indirect connection with its advantages to the building interest of the United States. We export one-fourth of our cereal products, but if the predictions of some of our economists are true, Egypt and Asia will supply the requirements of Europe and Great Britian on more favorable terms. But in the domain of mechanics and in the domain of manufacturing we possess advantages which cannot be offset or overcome by cheap land and cheap labor in the remote sections of the world. It is herein that American enterprise has a vast field to fill, and it has entered upon that field with a vigor which indicates that it will fill its portion of it in a few years, with its usual enterprise and success. What has been done with American locomotives can be done with American wood-working machinery, hardware, tools and appliances of a hundred kinds. The agents of manufacturers who have been abroad during the past twelve months give rather flattering reports of the possibilities that are in store for our manufacturers when they learn what is wanted, and adapt themselves to meeting the requirements of people who are less progressive than ourselves.

Lumber manufacturers, according to very recent reports, will endeavor to meet the demand for lumber with a barely sufficient supply, rather than with an excess. Quiet predictions in trade circles have been made that lumber will advance between now and May, but the bare possibility of such an unfavorable result will bring about a cure in advance. A combination may be possible among the hemlock interests of Pennsylvania, or among the white-pine interests of Chicago, but the courses of supply are all abundant, and the necessities of manufacturers too restricted to admit of such restriction of supply as will have a marked effect upon prices. Hard woods are in active demand in nearly all markets. Buyers are not purchasing for the future, because of the information in their possession that the supply for the coming year will be unusually large. Yellow pine has slightly advanced on account of the higher freight rates. Walnut, cherry and mahogany are only moderately abundant. White pine is quiet at the usual low market rate, and all other kinds are moving along near the minimum quotations. In iron the situation is a little more encouraging. Production has been increased about eight thousand tons per week, as against the summer output. Finished iron, such as bars, sheets and plates, are selling at summer prices. Pipe-iron is scarce, because of the exceptionally active demand. Steel rails are firm and steady at $34 to $35. The production will be increased to one million tons. The textile manufacturers, the boot and shoe makers, the tool makers, and the manufacturers of boilers and engines, all intend to accept whatever risks are involved in a full production this winter.

BUILDING PATENTS

[*Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

331,269. SAFETY-CATCH FOR ELEVATORS.—Henry Albert, Crescent City, Cal.

331,271. BATH-TUB AND WASH-TUB COMBINED.—William P. Austin, New York, N. Y.

331,273. HYDRAULIC ELEVATOR.—Norman C. Bassett, Chicago, Ill.

331,289. TRANSOM-LIFTER. — Arthur English, Chicago, Ill.

331,312. COMPOSITION FOR FIRE-PROOFING AND OTHER PRESERVATIVE PURPOSES.—Abel Jean Martin, Paris, France.

331,341. RATCHET-DRILL. — Axel A. Storm, Chicago, Ill.

331,345. LINEAR OR OTHER SCALE. — Charles A. L. Totten, Garden City, N. Y.

331,370. SASH-FASTENER. — Martin Bourke, Youngstown, Ohio.

331,383. MIXED PAINT. — Herbert C. Dorr, San Francisco, Cal.

331,391. BRICK OR TILE DIE. — Jesse L. Friend, Perrysburg, Ind.

331,394. AUTOMATIC SPRINKLER FOR FIRE-EXTINGUISHERS.—Almon M. Granger, Medford, Mass.

331,395. GLASS TILE AND PROCESS OF MAKING THE SAME.—Jonathan Haley, Ravenna, O.

331,405. SAFETY-DEVICE FOR ELEVATORS. — William W. Jackson, Chicago, Ill.

331,406. SYSTEM OF TEMPERATURE REGULATION. —Warren S. Johnson, Whitewater, Wis.

331,409. BOILER-COVERING. — Matthew Keenan, Armagh Works, Tredegar Road, North Bow, County of Middlesex, Eng.

331,420. BRICK-MACHINE. — Peter B. Mathiason, St. Louis, Mo.

331,428-429. FIRE-ESCAPE. —Patrick H. Montague, St. Louis, Mo.

331,431. STEAM-GENERATOR. — William H. Page, Preston, Conn.

331,433. ATTACHMENT FOR LEVELLING-INSTRUMENTS AND TRANSITS. — Frank Parson, Raton, New Mexico.

331,455. HEATING-STOVE.—William C. Smith, Warsaw, Mo.

331,466. HANGING-WINDOW. — John R. Whitney, Radnor, Pa.

331,469. MATERIAL FOR THE DECORATION OF THE INTERIOR WALLS AND CEILINGS OF BUILDINGS. — Jacob M. Baker, Boston, Mass.

331,489. FIRE-ESCAPE. — Jennie R. Fuller, Toledo, Ohio.

331,500. TILE SECTION BETWEEN WALLS, JOISTS, ETC.—William F. Higgins, San Francisco, Cal.

331,519. SIDING-REST. — John McDonald, Central City, Neb.

331,520. COMBINATION-WRENCH.—Winfield S. McKenzie, Kemp, Tex.

331,551. OPERA-CHAIR. — John M. Sauder, Harrisburgh, Pa.

331,556-558. VALVE FOR WATER-CLOSETS. — William Scott, Malden, Mass.

331,579-581. MACHINE FOR MAKING TUBES FROM HOLLOW INGOTS. — Stephen P. M. Tasker, Philadelphia, Pa.

331,592. SASH - BALANCE. — Jacob Weber, New York, N. Y.

331,595. MEANS FOR DETECTING AND CARRYING OFF LEAKAGE FROM GAS-MAINS. — Geo. Westinghouse, Jr., Pittsburgh, Pa.

SUMMARY OF THE WEEK.

Baltimore.

DWELLINGS. — W. F. Weber, architect, has prepared plans for W. T. & G. E. Slothower, for 2 three-st'y brick and stone buildings, to be erected cor. Mulberry and Greene Sts., on lot 25' x 60'; cost, $4,800; Lewis C. McCusker, builder.

BUILDING PERMITS.—Since our last report ten permits have been granted, the more important of which are the following: —

Jos. Scherer, three-st'y brick building, 23' x 130', w s Broadway, between Pratt and Gough Sts.

W. L. Stork, 15 three-st'y brick buildings, e s Calvert St., between Biddle and Preston Sts.

P. M. Evans & Co., 2 two-st'y brick buildings, w s Mount St., n of Franklin St.

Peter Bremer, 18 two-st'y brick buildings, s s Ramsay St., between Monroe and Payson Sts.

Carlos Maris, 2 two-st'y brick buildings, e s Madeira Alley, n of Bank St., and two-st'y brick building in rear.

Boston.

BUILDING PERMITS. — *Wood.* — *Downer St., No.* 30, storage, 16' x 20'; Margaret Roach, owner; J. C. Noonan, builder.

Champney Pl., cor. Champney St., dwell., 20' x 30'; Ulrich Wilhern, owner and builder.

Sparhawk St., near Sparhawk Ave., stable, 30' x 40'; T. J. Young, owner; S. A. Davenport, builder.

Dennis St., No. 6, dwell., 20' x 45'; F. R. Perkins, owner; C. A. Jefferson, builder.

Clifton St., No. 71, dwell., 21' x 32'; G. A. Gifford, owner and builder.

Brooks St., e Pine St., dwell., 19' 6" x 21'; J. E. Blakemore, owner; W. A. Mitchell, builder.

Sycamore St., s w cor Pine St., dwell., 19' 6" x 21'; J. F. Blakemore, owner; W. A. Mitchell, builder.

Adams St., No. 228, green-house, 26' 6" x 82' 6"; Jasem Gordon, owner; W. H. Gordon, builder.

Paris St., No. 242, stable, 15' x 18'; J. E. Lawton, owner and builder.

Washington Pl., w Tremont St., dwell., 23' x 43'; F. W. Gordon, owner and builder.

East Sixth St., Nos. 413, 445, 447, dwell., 15' 9" x 29'; James V. Devine, owner and builder.

Lark St., No. 32, shed, 24' x 58'; J. R. Symes, owner. Wm. Glynn, builder.

Waverly Pl., w Waverly St., dwell., 20' x 30'; J. F. Mead, owner and builder.

Brooklyn.

BUILDING PERMITS. — *Jefferson St.*, s s, 430' w Marcy Ave., 7 three-st'y brown-stone dwells., tin roofs; cost, each, $7,000; owner and builder, Harman Phillips, 289 Jefferson St.; architect, I. D. Reynolds.

Fulton St., n s, 160' e Bedford Ave., 3 four-st'y brown-stone stores and tenements, tin roofs; cost, each, $8,000; owner, A. C. Brownell, 261 Putnam Ave.; architect, A. Hill.

Middleton St., n s, 235' e Marcy Ave., five-st'y brick factory, tin roofs; cost, $18,000; owners, Wm. Lang & Co., South Sixth St., cor. First St.; architect, H. Vollweiler; builder, J. Rueger.

McDougal St., n s, 75' w Hopkinson Ave., 4 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,500; owner, architect and builder, Baldwin Pettit, 79 Hull St.

Clifton Pl., No. 76, s s, 275' e Grand Ave., four-st'y brick double flat, gravel roof; cost, $10,000; owner, architect and builder, J. N. Smith, 257 Greene Ave.

George St., n s, 175' e Knickerbocker Ave., 2 three-st'y frame (brick-filled) store and tenements, tin roofs; cost, each, $4,000; owner, architect and builder, Joseph Harte, 169 Boerum St.

Woodbine St., n s, 107' e Broadway, 5 two-st'y frame dwells., tin roofs; owner, Thos. J. Allen, 931 Gates Ave.; builder, T. B. Thomas.

Greene Ave., s s, 400' e Bedford Ave., 6 three-st'y brown-stone dwells., tin roofs; cost, each, about $6,000; owner, T. H. Brush, 587 Bedford Ave.; architect, F. E. Lockwood.

Woodbine St., e s, 310' e Broadway, 2 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,879; owner, Fred. Cazner, 745 Munroe St.; architects, Parfitt Bros.; builder, not selected.

Dodworth St., n s, 120' 10" e Broadway, three-st'y frame tenement, tin roof; cost, $4,000; owner and builder, Chas. Loeffler; architect, H. Vollweiler.

Wyckoff St., s s, 100' w Nevins St., four-st'y brick tenement, tin roof; cost, $9,000; owner and builder, John M. O'Neil; architect, R. Dixon.

Twenty-fourth St., n s, between Fifth and Sixth Aves., one-st'y brick engine and boiler-house, tin roof; cost, $2,000; owner, Atlantic Ave. R. R. Co.; architect, Mr. Cogswill; builders, J. J. Cody and O'Donnell & Feenan.

Hull St., s s, 225' w Stone Ave., 4 three-st'y brick tenements, gravel roofs; cost, each, $4,500; owner, W. H. H. Robbins; architect, B. T. Robbins; builders, C. V. Robbins and J. Remsen.

Broadway, e s, 174' s De Kalb Ave., four-st'y brick store and tenement, tin roof; cost, $5,500; owner, C.

H. Reynolds, 810 Bushwick Ave.; architect, J. D. Hall; builder, S. W. Post.

Calyer St., *No.* 80, s s, 175′ w Franklin St., three-st'y frame (brick-filled) tenement, tin roof; cost, $1,200; owner, Geo. H. Christoffer, 439 First St.; architect, F. Weber.

Evergreen Ave., w s, 25′ n Ralph St., 2 three-st'y frame (brick-filled) tenements, gravel roofs; cost, $9,600; owner, John Menehan, Ralph St., near Evergreen Ave.; architect, F. Weber; builder not selected.

Patchen Ave., s e cor. Bainbridge St., 3 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,500; owner, architect and builder, H. Grassman, 364 Vernon Ave.

Prospect Pl., n s, 100′ e New York Ave., two-st'y brick and slate stable, tin and slate roof; cost, $2,-500; owner, A. M. Davis, 798 St. Marks Ave.; architect, A. Hill; builder, D. H. Fowler.

St. James Pl., n w cor. Lafayette Ave., Ohio stone church, slate roof; cost, $85,000; owner, Emanuel Baptist Church; architect, J. H. Kimball; masons, Mahoney & Watson; contractor, not selected.

Third Ave., s e cor. Forty-second St., three-st'y frame store and tenement, tin roof; cost, $6,100; owner, Patrick McInerny; architect, G. Damen; builders, Spence Bros.

Lynch St., s s, 180′ w Marcy Ave., 14 three-st'y frame tenements, tin roofs, (brick-filled); cost, each, $4,500: owner, Mary Mulvihill, 115 Lynch St.; architect, J. Platte; builder, N. Mulvihill.

Middleton St., n s, 80′ w Marcy Ave., 18 three-st'y frame (brick-filled) store and tenements, tin roofs; cost, each, $4,500; owner and builder, Jacob Bossert, Hayward St., near Harrison Ave.; architect, J. Platte.

Withers St., *No.* 147, n s, 150′ e Ewen St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,300, owner and architect, Patrick Clark, 149 Withers St.; builders, J. Rueger and B. Guenshe.

Seventh Ave., s e cor. Sixteenth St., 6 three-st'y brick stores and dwells., tin roofs; cost, total, $31,-000; owner, Ralphina Kirkman, 415½ Eighteenth St.; architect and builder, Ralph Kirkman.

ALTERATIONS. — *Suydam St.*, n s, 137′ w Bushwick Ave., two-st'y extension, felt and shingle roof; cost, $4,000; owner, Mrs. J. D. Froelich, Bushwick Ave., n w cor. Suydam St.; architect, F. J. Berlenbach, Jr.; builder, not selected.

Twenty-fourth St., between Fifth and Sixth Aves., insert girders and columns, interior alterations, etc.; cost, $3,000; owner, Atlantic Ave. R. R. Co.; architect, M. C. Coggswell; mason, not selected; contractor, M. C. Coggswell.

Heyward St., s s, 60′ e Wythe Ave., three-st'y brick extension, gravel roof; cost, $4,200; owner, Kiernan Egan, 5852 Clermont Ave.; architect, I. D. Reynolds.

Chicago.

BUILDING PERMITS. — Mrs. M. B. Neff, three-st'y flats, 1058 and 1060 Washington Boulevard; cost, $48,000; architect, Van Osdel.

H. H. Brown, three-st'y store and dwell., Polk St. and Ogden Ave.; cost, $15,000.

A. M. Fuller, three-st'y store and flats, 520-522 Van Buren St.; cost, $12,000; architect, J. B. Shipman.

C. E. Brown, three-st'y store and flats, 1091 and 1093 West Harrison St.: cost, $12,000; architects, Thomas & Rodgers.

J. Wolford, two-st'y dwell., 552 North State St.; cost, $4,500.

A. Doughty, two-st'y stable, 404 Webster Ave.; cost, $6,000.

P. S. Kirkwood, 5 three-st'y stores and flats, 315-323 Madison St.; cost, $20,000; architect, H. G. Miner.

F. Larned, 2 three-st'y dwells., 2712-2714 Michigan Ave.; cost, $20,000.

H. Lindemann, two-st'y flats, 251 West Division St.; cost, $2,500.

Mrs. M. Schultz, three-st'y flats, 184 South Peoria St.; cost, $4,000.

W. Cass, 5 three-st'y stores and flats, 167-173 Harrison St.; cost, $16,000; architect, W. A. Furber.

City of Chicago, two st'y police-station, 187 Canalport Ave.; cost, $10,000.

W. P. Hock, 2 three-st'y stores and dwells., 78 and 80 North Halsted St.; cost, $15,000; architect, J. Otto.

L. L. Coburn, 2 three-st'y stores and flats, 275-277 Van Buren St.; cost, $8,000; architect, H. L. Halberg.

W. S. Walker, 4 two-st'y dwells., 3612-3622 Ellis Ave.; cost, $20,000; architects, Patten & Fisher.

D. B. Shipman, two-st'y addition, rear 1510 State St.; cost, $6,000.

F. B. Clark, 3 two-st'y flats, 948-952 Taylor St.; cost, $10,000.

J. L. Campbell, three-st'y flats, 906 West Polk St.; cost, $7,000; architect, H. B. Seeley.

J. L. Campbell, 2 two-st'y dwells., 736-741 Warren Ave.; cost, $10,000; C. A. Weany, architect.

R. Tobin, three-st'y store and dwell., 181 Blue Island Ave.; cost, $6,000; architect, W. H. Drake.

J. Zarnbsky, three-st'y store and dwell., 705 Throop St.; cost, $8,000; J. Wetner, architect.

A. Breicher, 2 three-st'y stores and dwells., 596 and 598 Blue Island Ave; cost, $15,000; architect, A. Loula.

J. M. Thacher, 7 two-st'y dwells., 3700-3712 Ellis Ave.: cost, $25,000; architect, L. G. Halberg.

E. Lehman, four-st'y store and dwell., 558 West Harrison St.; cost, $6,000.

E. Lehman, three-st'y store and dwell., 205 and and 207 Loomis St.; cost, $4,000.

Chicago & Eastern Illinois Railroad Co., freight-house, Dearborn St.; cost, $10,000.

J. M. Dooley, two-st'y flats, 319 West Huron St.; cost, $3,000; architect and builder, J. M. Dooley.

J. J. Curran, three-st'y store and flats, 350-354 Blue Island Ave.; cost, $25,000; architects, Edbrooke & Burnham.

Mrs. H. G. Stockton, three-st'y dwell., 333 Rush St.; cost, $7,000; architects, Treat & Foltz.

P. Sholze, three-st'y store and dwell., 418 Ogden Ave.; cost, $6,000; architect, Hildenger.

O. D. Wetherell, two-st'y barn, Calumet Ave.; cost, $3,000; architects, Burnham & Root.

Mrs. J. Lindgren, 3 three-st'y stores and flats, 173-177 East Chicago Ave.; cost, $25,000; architect, H. Harrison.

T. Oston, 2 two-st'y dwells., 3157 and 3159 South Park Ave.; cost, $10,000; architect, W. A. Furber.

G. F. Harding, 11 two-st'y dwells., 3301-3321 Vernon Ave.; cost, $45,000; architects, Wheelock & Clay.

Little Rock, Ark.

BUILDING PERMITS. — Two-st'y brick store, Main St.; owner, Isaac Kempner; architect, J. B. Bartlett; cost, $7,000.

Remodeling Hyde's Opera-House, Markham St.; owner, Dr. C. Watkins; architect, J. B. Bartlett; cost, $12,000.

Two-st'y brick store, Markham St.; owners, Hornibrook & Townsend; architect, J. W. Lavender; cost, $6,000.

Iron-clad cotton warehouse, Scott St.; owners, Hall & Matthews; cost, $3,000.

Brick cotton warehouse, Scott St.; owners, J. B. Miller & Co.; architects, Pettefer Bros.; cost, $3,-000.

Remodelling office and reading rooms Capitol Hotel, Markham St.; owner, Dr. C. Watkins; architect, J. Harding; cost, $4,000.

County jail, Water St.; owners, Pulaski County; architect, J. B. Bartlett; cost, $16,990.

Milwaukee, Wis.

BUILDING PERMITS. — C. Duchow is building an $8,500 brick house on Milwaukee St., for J. H. Frank.

M. Thielan is putting up a $2,200 frame house, on Farwell Ave., for Peter Ehr.

J. Markey is building a row of brick tenements on Eighth St., at a cost of $4,000.

C. Gilhaar is building a $5,000 frame house on Nineteenth St., for Jos. Leedom.

C. Gilhaar is also building a frame house on Eighteenth St., for I. P. Ticknor, at a cost of $5,000.

Also a double frame dwell., on the cor. of Thirty-fourth and Wells Sts., for E. A. Austin, at a cost of $3,000.

Paul Vogt & Co. are erecting a sash and door factory on Island Ave., at a cost of $6,000.

Minneapolis, Minn.

BUILDING PERMITS. — J. W. Day & Co., two-st'y wood saw mill, n e cor. Stevens St. and Twenty-fourth Ave., n; cost, $15,000.

J. W. Day & Co., one-st'y brick engine-house, n e cor. Stevens St. and Twenty-fourth Ave., n; cost, $3,000.

Mary A. McLaughlin, 2 two-st'y wood dwells., e s Stevens Ave., bet. East Thirty-first and East Thirty-Second Sts, s; cost, $7,000.

Chas. T. Harris, two-st'y brick veneer dwell., w s Grand St., bet. East Twenty-second and East Twenty-third Sts., s; cost, $3,000.

New York.

COTTAGES. — A number of cottages are to be built near St. Mary's Park, for Mr. C. P. Huntington, from plans of Mr. Jas. Stroud, and a number are also expected to be built at South Yonkers, on property of Jas. Gordon Bennett and others, from plans of Messrs. Berg & Clark.

STORE. — On the n e cor. of Third Ave. and Eighteenth St., a store-building, of brick, stone and terra-cotta, 74′ x 80′, is to be erected for Messrs. Eimer & Amend, from plans of Messrs. De Lemos & Cordes.

TENEMENTS. — On the n e cor. of Second Ave. and One Hundred and Second St., 8 five-st'y brick and stone tenements and stores, 25′ x 75′ each, are to be built at a cost of $136,000, for E. C. M. Rand, from plans of Mr. Wm. Baker.

BUILDING PERMITS. — *Sixty-second St.*, s s, 200′ w Tenth Ave., 8 five-st'y brick tenements, flat tin roofs; cost, $120,000; owner, Fred T. Camp, 60 Liberty St.

Eighth Ave., n w cor. One Hundred and Sixteenth St., five-st'y brick store and dwell., flat tin roof; cost, $18,000; owner, Hiram Moore, 56 East One Hundred and Tenth St.; architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.

West Forty-third St., *Nos.* 323 *and* 325, 2 five-st'y brick tenements, brick and brown-stone fronts, flat tin roofs, cost, $40,000; owner, Wm. Rankin, 563 West Fifty-first St.; architect, George Keister, 347 West Forty-third St.

Second Ave., e s, Eighty-eighth to Eighty-ninth St., 8 five-st'y brick tenements, flat tin roofs; cost, $120,000; owner, Frederick Schuck, n w cor. Ave. A and Eighty-fifth St.; architect, John Brandt, 1491 Third Ave.

One Hundred and Sixth St., s s, 100′ w Third Ave., five-st'y brick tenements, flat tin roof; cost, $21,000; owner, Whitfield Terreberry, 243 Broadway; architect, John C. Burne, Third Ave. and Eighty-sixth St.

East Eighty-seventh St., *No.* 174, two-st'y brick workshop, flat tin roof; cost, $3,500; owner, Francis E. Becker, 118 East Eighty-seventh St.; architect, Wm. Stauffer, 341 East Eighty-seventh St.

One Hundred and Twenty-first St., s s, 115′ e Fourth Ave., 2 five-st'y brick tenements, flat tin roofs; cost, $40,000; owner, Christiana R. Kehoe, 57 East One Hundred and Twenty-first St.; architect, Alfred Kehoe, 57 East One Hundred and Twenty-first St.

One Hundred and Sixty-ninth St., n e, 175′ e Eleventh Ave., three-st'y wooden dwell., peak tin roof, cost, $3,000; owner, John Devlin, One Hundred and Sixty-fifth St., e of Tenth Ave.; builder, Jeremiah Sullivan, One Hundred and Fifty-ninth St. and Tenth Ave.

Eighth Ave., w s, 20′ 11″ n One Hundred and Sixteenth St., 4 five-st'y brick tenements, flat tin roofs; cost, $64,000; owner, Hiram Moore, 56 East One Hundred and Tenth St.; architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.

Seventh Ave., w s, 50′ s from Seventh Ave., three-st'y brick dwell., flat tin roof; cost, $13,000; owner, P. J. O'Brien, One Hundred and Forty-third St., between Seventh and Eighth Ave.; architect, W. P. Anderson, 102 South Fifth Ave.

First Ave., w s, n e cor. Ninety-seventh St., 4 five-st'y brick tenements, flat tin roofs; cost, $52,000; owner, F. A. Clark, 236 East Ninety-seventh St.; architect, John Brandt, 1491 Third Ave.

Ninety-seventh St., s s, 80′ w First Ave., 2 five-st'y brick tenements, flat tin roofs; cost, $34,000; owner, F. A. Clark, 236 East Ninety-seventh St.; architect, John Brandt, 1491 Third Ave.

Clifton St., s s, 25′ w Ave. C, two-st'y frame dwell., flat tin roof; cost, $3,800; owner, John Rieglemann, Clifton St. and Ave. C; architect, Adolph Pfeiffer, 891 North Third Ave.

Four-st'y brick engine and cooler room, flat tin roof; cost, $18,000; owners, Beaclestone & Woerz, West Tenth St., near Washington St.; architects, A. Pfund & Son, 232 West Thirty-sixth St.

West Fifty-seventh St., *No.* 420, two-and-a-half-st'y brick mission-house, peak and flat slate and tin roof; cost, $14,000; owner, Samuel Inslee, 169 West Forty-seventh St.; architect, Samuel Warner, 132 Broadway.

One Hundred and Sixteenth St., n s, 90′ w Eighth Ave., 3 five-st'y brick tenements, flat tin roofs; cost $48,000; owner, Hiram Moore, 56 East One Hundred and Tenth St.; architect, J. H. Valentine, 108 East One Hundred and Twenty-fifth St.

Thirty-fourth St., s s, 105′ w Tenth Ave., five-st'y brick tenement, flat tin and plastic slate roof; cost, $16,000; owner, John Livingston, 130 East Seventy-first St.; architect, Fred. T. Camp, 60 Liberty St.

ALTERATIONS. — *East Fifty-fifth St.*, *Nos.* 415 *and* 417, three-st'y brewery-building, flat roof, internal alterations, etc.; cost, $3,000; owner, Peter Doelger, 405 East Fifty-fifth St.; architect, Chas. Stoll, 134 Broadway.

Fifth Ave., cor. Nineteenth St., four-st'y brick building, to be altered to art-gallery; cost, $9,000; lessees, C. R. Yandell & Co., 50 West Nineteenth St.; architects, McKim, Mead & White, 57 Broadway.

Greenwich St., No. 334, and *Washington St.*, *No.* 321, five-st'y brick storage and business building, internal alterations, etc.; cost, $15,000; owner, Sarah Taylor, 436 West Twenty-third St.; architects, Babcock & McAvoy, 64 College Pl.

Messrs. J. C. Cady & Co. are the architects selected for the building Nos. 34 and 36 Wall St.

Philadelphia.

BUILDING PERMITS. — *Chestnut St.*, w of Thirty-eighth St., 10 two-st'y dwells., 15′ x 44′; Jno. G. Ruff, contractor.

Woodstock St., s of Dickinson St., 13 two-st'y dwells., 11′ x 28′; L. Simpson, owner.

Cope St., s of Chestnut St., 2 two st'y dwells., 16′ 6″ x 2?′; Jno. Develin, owner.

Oxford St., *No.* 2611, two-st'y dwell., 14′ x 40′; Jno. Spoeri, owner.

Wister St., Germantown, three-st'y back building, 16′ x 42′; J. D. Caldwell, owner.

Clearfield St., w of Twentieth St., three-st'y dwell., 15′ x 37′; Chas. Savage, contractor.

Twentieth St., cor. Columbia Ave., alteration, 20′ x 30′; Thos. McCarthy, contractor.

Oxford St., near Twenty-first St., one-st'y shop, 18′ x 30′; Griffin & Lawrence, owners.

Hancock St., n of Huntingdon St., two-st'y stable, 90′ x 200′; Samuel Hart, contractor.

Frankford Road, *No.* 1123, three-st'y dwell., 18′ x 54′; Jacob Baxter, owner.

Hancock St., cor. Herman St., three-st'y addition, 16′ x 56′; O. P. Fisher.

Gowen Ave., e of Sprague St., two-st'y dwell., 34′ x 41′; Jno. Hartman, owner.

Moore St., e of Otsego St., three-st'y factory, 75′ x 100′; A. M. Green & Co., contractors.

Fifth St., near Venango St., 2 two-st'y stores, 15′ x 42′; J. Vanderslick, owner.

Arch St., s e cor. Twenty-third St., one-st'y blacksmith shop, 20′ x 30′; R. W. Strode, contractor.

Second St., s of Butler St., one-st'y boiler-shop, 10′ x 50′; Einwechler & Co., contractors.

South Thirteenth St., *No.* 1216, one-st'y store, 19′ x 35′; R. D. Clark, contractor.

Reed St., *No.* 308, in rear, two-st'y stable, 35′ x 85′; J. W. Kuhn, contractor.

Boyer St., near Gower Ave., three-st'y dwell., 31′ 6″ x 37′ 6″; W. Flanagan, contractor.

Broad St., cor. Susquehanna Ave., two-st'y factory, 28′ x 39′; Jos. Warrington, owner.

Tyson St., s of Lehigh Ave., 9 two-st'y dwells., 13′ x 28′; Jno. Loughrin, owner.

Third St., n of Lehigh Ave., two-st'y office, 22′ x 44′; Jos. Parker, contractor.

Fifteenth St., near Tioga, two-st'y dwell., 17′ x 48′; B. Devine, contractor.

Ninetieth St., cor. First Ave., three-st'y dwell., 25′ x 42′; Geo. F. Herr, contractor.

St. Louis.

BUILDING PERMITS. — Eight permits have been issued since our last report, three of which are for unimportant frame houses. Of the rest those worth 2,500 and over are as follows: —

J. S. McClellan, two-st'y brick dwell.; cost, $4,500; L. Cass Miller, architect; J. B. Asper, contractor.

John T. Scheneder, two-st'y brick tenements; cost, $4,900; Ed. C. Henner, architect and contractor.

Mrs. L. M. Riley, two-st'y brick store and dwell.; cost, $2,700; architect, F. G. Polk; contractor, Jus. Wesling.

General Notes.

ANDOVER, MASS. — Arrangements for the erection of the new church for the Episcopal parish, Rev. Leverett Bradley, rector, have been completed. The church itself will be built and furnished complete by Mr. John Byers, at an estimated cost of $35,000. The architects of the church are Messrs. Hartwell & Richardson of Boston, and the whole work will be executed under the supervision of the donor's brother, Mr. Joseph Byers of Newtonville.

BATH, L. I. — The Hamilton Club, of Brooklyn, have purchased a tract of land at Bath, L. I., 390′ on the bay and 300′ deep, of Carl Racknagel, for $55,000. A new club-house will be built upon the grounds.

CAPE MAY, N. J. — The members of the Grand Army of the Republic are to erect a monument costing $14,000, to the memory of the soldiers from that county who were killed in the Civil War.

AMERICAN ARCHITECT AND



S. Maria

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HELIOTYPE PRINTING CO. BOSTON.

...iore, Rome.

A HOMILY FOR HOLIDAYS.

"And books, we know,
Are a substantial world, both pure and good;
Round these, with tendrils strong as flesh and blood,
Our pastime and our happiness will grow."

In these words, oh gentle architects and scholars of æsthetic arts and students of the ancient craft of masonry, doth the wise and learned Wordsworth address his little flock, in those days a feeble folk of Westmoreland, but now latterly amplified to reach from Florida and Canada to Australia and Natal. A good book, therefore, according to the sage of Grasmere, is a goodly world, perpetually prolific of joy and tranquil delight.

We say a good book, because, although there be bad books enow, we wot not of them, being wise only as to the works brought forth by the ancient house of Ticknor and Company, at the sign of 211 Tremont Street, in the town of Boston. And it is of these that we would briefly speak unto you, oh builders of palaces and temples, and eke of draw-bridges and freight-houses, for the days of Christmas plaisance be near at hand, wherein each man doth wish joy to his neighbor, and plotteth glad gift-bearing enterprizes against his friend, and the daughter of her whom he hopeth to intitule mother-in-law. And of all gifts that may be desired, surely nothing can surpass that of "a pure and good world" — which, as the saintly Wordsworth doth assure us, is equaled and emblemized by books. Therefore, we shall presently set forth on this manuscript some accompt of the newest wares of Messires Ticknor, aforesaid, to the laudable end, that ye may choose from them (if such be your pleasure) wherewith to make glad the heart of those who do not fear the Greeks, and those who bring gifts. These, also, shall not be as the confectionery that perisheth, or the Christmas card that curleth up and fadeth, or the rich apparel that joyeth for a time and then wasteth away. For books are well-nigh imperishable; and in their resources for delight, inexhaustible; and he who joineth himself unto them doth find consolation for daily cares, refreshment that giveth more strength the more it is called upon, and a precious familiarity that doth but enhance itself with every hour of possession.



The Parthenon, at Athens. From "Childe Harold."

First, then, come we to the flower and paragon of gift-books for the wintry festival season, the newly illustrated and cunningly devised imprinting of the great Lord Byron's Romaunt of Childe Harold's Pilgrimage, as arranged by Messires Ticknor, and decked with pictures by the deftest artists of the American land. It is of this noble new edition that Richard Henry Stoddard, poet at once and critic, in art wise and in literature profound, hath set forth his thoughts as follows, in the crisp and ringing speech of the electric age: —

"Messrs. Ticknor and Company start off finely in the line of illustrated books, with a beautiful edition of *Childe Harold's Pilgrimage*, upon which nine of our most accomplished draughtsmen and seven of our most skilful wood-engravers have expended the resources of their art. Comparisons are odious, as we all know, and we shall not indulge in them by comparing this illustrated edition of a favorite poet with any other illustrated edition of any other favorite poet. What we will say, however, is that given our choice between this poem and any other poem or poems that have been or are likely to be published during the present season, we should give the others the go-by, and select this, not merely as the most to our special taste, but as one of the noblest and greatest poems in the whole range of English poetry. It is not the fashion to admire Byron now, and it is the fashion to pretend to admire Wordsworth. One may admire both without instituting comparisons between them; and for Wordsworth's sake they never should be instituted, for the author of "Peter Bell" was a poet of one order and the author of Childe Harold was a poet of another and a much higher order, as every reader of Byron feels, in spite of all that Mr. Swinburne and Mr. Arnold and the rest of the Wordsworthians may say to the contrary. He is the greatest elemental force in English song since Marlowe, and not to know this is to have read all the poets that come between the two in vain. There is a wild, fiery, passionate life in his work, even when it is most careless, which no other English poet, except Shakespeare, ever attained, and it is refreshing to turn from the finicken, elaborate, rococo, make-believe verse of the present period to his manly and magnificent poetry. He is at his greatest, we think, in the third and fourth cantos of Childe Harold, who, as an ideal creation, was fitly described by Shelley as the Pilgrim of Eternity. How nobly he wrote, let a couple of stanzas show: —



From "Childe Harold."

O Rome! my country! city of the soul!
The orphans of the heart must turn to thee,
Lone mother of dead empires! and control
In their shut breasts their petty misery.
What are our woes and sufferings? Come and see
The cypress, hear the owl, and plod your way
O'er steps of broken thrones and temples, ye
Whose agonies are evils of a day —
A world is at our feet as fragile as our clay.

The Niobe of nations, there she stands
Childless and crownless, in her voiceless woe;
An empty urn within her withered hands,
Whose holy dust was scattered long ago;
The Scipios' tomb contains no ashes now:
The very sepulchres lie tenantless
Of their heroic dwellers; dost thou flow,
Old Tiber, through a marble wilderness?
Rise, with thy yellow waves, and mantle her distress!

The illustrations in this beautiful edition of Childe Harold are not in the fantastic art manner of the period, but are conceived and executed in the good, old-fashioned, manly style that characterized the best days of drawing and engraving. They are for the most part beautiful, and when they do not reach that ideal excellence they are in all cases picturesque and intelligent. There are no crochets in them, for the artists who made them were content to illustrate the text in the direct method in which it was written. From the nature of the poem they are largely landscapes, the special features of each verse being happily caught, with artistic gradations of light and shade. Taken as a whole, the effect they have upon the mind is one of simple, serene loveliness. And they have a quality which we miss in much of the black and white work of to-day — they will bear looking at more than once. They should be studied, as Childe Harold should be read, over and over again."

Uniform with this superb edition of Childe Harold, and sold for the same price ($6; morocco, or tree-calf, $10; crushed levant, $25) are similarly notable illustrated octavo editions of "Marmion," "The Princess," "The Lady of the Lake" and "Lucile," four of the most famous and picturesque poems in the English language, and each of them illustrated by a group of distinguished artists. The beautiful Scottish scenery of Sir Walter Scott's rymthical romances, the Rhineland and Cyrenean scenes of "Lucile," and the lovely girl graduates of Tennyson's greatest poem are here illustrated with great art and skill and suggest new reading to the favorite poems.

"Japanese Homes and their Surroundings," (8vo; with over 300 Illustrations; $5.00,) is a noble and unique book, written by Prof. E. S. Morse, who was born at Portland, Me., in 1838, and at an early age preferred the woods and streams to the academy, finding special delight in the study of shells, both land and marine. He also prepared himself for close observation by prolonged studies in drawing, spending several years in practice as a professional draughtsman. From 1859 to 1862 Morse studied biology under Agassiz, at Cambridge, attending also the lectures of Wyman, Cook, and Lowell. In 1866 he settled at Salem, Mass., where he still resides, as Director of the Peabody Academy of Science. The chief scientific societies have chosen him to their memberships and to conspicuous offices in their organizations. In 1877 Professor Morse decided to visit Japan, in order to dredge along the coast and find, perchance, new specimens in his favorite lines of research, especially of *brachiopods*, — an ancient, interesting, and wide-spread variety of deep-water creatures. The Japanese authorities secured his promise to return and accept the chair of zoölogy at the Imperial University at Tokio. Accordingly, in 1878 he took his family to Japan and established a home there, where he dwelt for nearly two years, actively engaged at the University, teaching, establishing a zoölogical station on the Bay of Yeddo, studying the traces of primitive man on the Japanese islands, and making voluminous notes and sketches of ethnological interest. He subsequently made a third visit to Japan, for the sole purpose of collecting and completing his illustrations to the present and other works.



From "Japanese Homes."

"Japanese Homes and their Surroundings" is thus the result of several explorations of that delightful country, from Yeddo to Satsuma, and is gleaned from the author's illustrated daily journal, and illustrated with 300 *fac-simile* reproductions of his pen-and-ink drawings, — drawings whose rare precision and scientific accuracy are apparent at a glance. In these illuminated pages are found the fullest details of the dwellings and house-interiors of that interesting people, whose exquisite art, gentleness of life, and refinement have within a few years exercised so profound and startling an influence upon Europe and America. Not only have the present peculiarities of the Japanese house been vividly described by Professor Morse, but also careful studies have been made by him of certain interesting features that are now passing away in the rapid changes of that nation's life and administrations. In this way, and in its references to the primitive days of Japan, the book has a great and enduring value from a historical point of view.

There are very few books of value relating to the Island Empire of the Pacific. Hundreds of books have been written and published, all in very much the same vein, with illustrations copied from proceeding works, or from Japanese sources, and facts acquired in a similar way. The carefully analytic and exhaustive chapters of Professor Morse's book show us a Japan of a different nature from that sketched out by hasty tourists, — a country full of life and form; of clearly defined personal, social, and municipal laws; of immemorable traditions; of a unique and vigorous civilization, in many respects superior to and more comfortable than that of the Caucasian nations.

The various items of household management, rooms, furniture, utensils, tools, gateways, fences, gardens, objects of art, etc., are described in detail, in skillfully grouped sections, each one of which is monographic in its completeness and concentration, and illustrated with pictures of articles of household use in the class under consideration. In this way may be gained a perfectly clear and interesting idea of every phase of a Japanese home of the middle class, while frequent allusions to the corresponding things in houses of the peasantry and of the wealthy people give a broad *aperçu* of the life of the country.

No such book has ever before been published about Japan, if, indeed, such a work has ever been written about the dwellings of any nation in the world. The drawings are very numerous, and exhibit a rare precision, delicacy, and vitality. Bringing finely-trained faculties to the portrayal of a series of homes the most remarkable on the globe, Professor Morse has produced a work of permanent value.

"Choson: The Land of the Morning Calm," (8vo; copiously illustrated, $5.00) is a thorough and valuable study of Korea, by Percival Lowell, of Massachusetts, late Secretary and Counsellor to the Korean Special Mission to the United States of America, and Member of the Asiatic Society of Japan, etc. The binding of the book is peculiarly appropriate, and in a style of quaint beauty, which will attract the attention and please the taste of all lovers of art and good work.

Almost every one now knows that there is a peninsula of Asia, shaped somewhat like Florida, and situated much the same in relation to that continent as Florida is to North America. The Peninsular, which is called by the natives Ta-Chō-sun, and by Europeans the Korea, was long believed by the latter to be an island, and represented as such in their maps. It has an area about equal to Italy, or the State of Minnesota, and its physical features are very much like those of California. The Koreans being conservative and exclusive, like many other Asiatic nations, very little has been learned about their country till lately, except from shipwrecked sailors who have been captives in it. The Korean Kingdom in 1884 entered the comity of nations, threw aside its hermit proclivities, and commenced making treaties of commerce, receiving and returning ambassadorial courtesies.

This is the first book by one who has been to, and lived in Korea. It is the first possible of such accounts, as owing to his intimate connection with the government, Mr. Lowell was enabled, not only to be among the first to enter the land, but to do so under exceptionally favorable circumstances for seeing and doing all that he desired. While before he actually set foot on the soil, he had been for months intimate with the Koreans themselves, under peculiarly intimate circumstances.

The style is a *juste milieu* between a book of narrative travel and a poetic essay on the Korean people. The author has made use of a narrative on which to thread his beads of manners and customs. He begins with a striking exposé of "Far Eastern Myths." He next draws a picture of the geography of the peninsula, and colors it with its own atmosphere, which is so important to the general effect, and which differs so from our own. After this he sets forth an account of his journey, from his landing in Korea till he reached the capital, Söul. He then gives us episodes of his life there, many of which would be highly amusing, even if they were not so quaint as they are. And through it all runs the careful observer who is as much poet as scientist. In form it avoids the pedantic, while furnishing us with accounts of the more salient Korean customs. Though it is a scientific production, its form and manner of telling is literary. The *ars celare artem* is witnessed by a note in the preface, where the care given to Korean spelling shows the careful scientist, who yet is never forced upon the reader's attention. In short, it is emphatically a book first to be read, and secondly to be referred to.



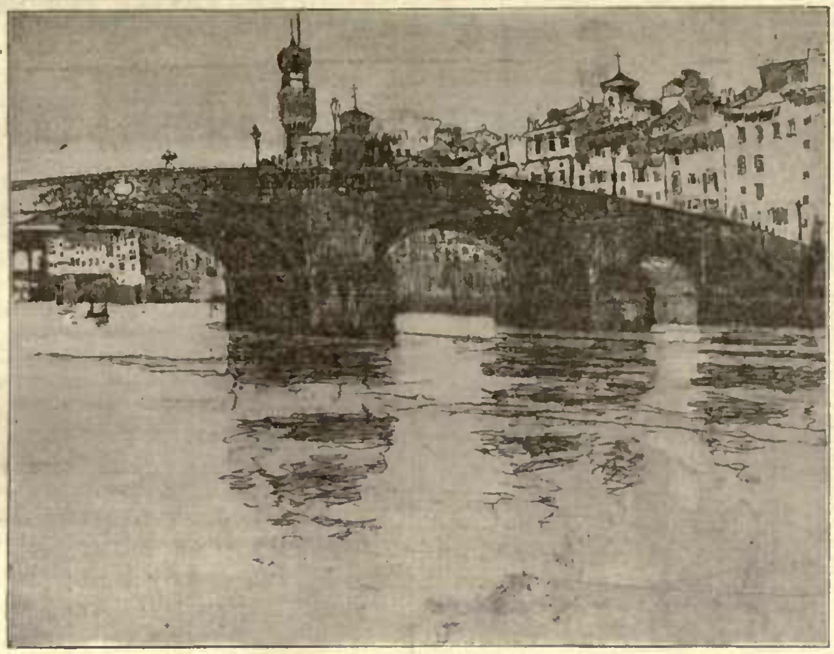
The Chinese General and the Unfortunate Imp. From "Choson."

In addition, he has scattered through the book chapters which will be found of a more exhaustive character, as on Architecture, Costume, Government, Landscape Gardening, etc., and one on the Superstitions of the Land. The book contains about 400 pages. Scattered through these are twenty-five albertypes from Mr. Lowell's original negatives. This clear and careful account of a remote and hitherto unvisited land will be of great value to all readers.

"He is equal as an artist to the best French writers. His books are not only artistically fine, but morally wholesome." — *Magazin für die Literatur.*

"This rich and picturesque volume." — *N. Y. Tribune.*

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Ponte Santa Trinita, Florence. — From "*Tuscan Cities.*"

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"Exquisite interpretations of life. He touches the measure of fascination." — *Boston Traveller.*

"In nothing he has written has William D. Howells shown more decidedly the artistic bias in his temperament than in this delightful volume." — *Art-Amateur.*

Tuscan Cities. (8vo; $5.00) is the latest and choicest of the travel-books of William D. Howells, whose earlier works on Italy have long been classic in every well-selected library. The light and life of the Tuscan paradise are fairly reflected in these glowing pages, where the usual plaititudes of the commonplace traveller are replaced by exquisite, historic, and biographic cameos, flashes of kindly humor, vivid and original characterizations. All these are illuminated from the graphic and spirited drawings and etchings of Joseph Pennell, who was sent to Italy for the purpose.

A recent number of *The Churchman* says that "to the cultivated reader who is denied the privilege of foreign travel, such a mentor as Mr. Howells is inestimably valuable. Few writers travel with such highly trained perceptions and that indefinable gift of selection and discrimination which makes sure of the best results and never passes off chaff for wheat. He is stereoscopic, philosophic, poetical, and learned, by turns, as mood and occasion warrant. He travels, like Goethe, gathering the cream of finest experiences by an unerring instinct. If you have read Howells intelligently, you have gone more thoroughly and wisely through his journey than many perhaps who bore him company."

Davy and the Goblin. (8vo; fully illustrated; $1.50) is one of those examples of juvenile literature that make middle-aged people wish they had not been born — until twenty years later. As a sequel to "Alice's Adventures in Wonderland," (and where is the child who has not grown round-eyed over that delightful work?) Mr. Charles E. Carryl has given to his young admirers a perfectly charming story in "Davy and the Goblin." Wedded to language suited to the comprehension of young readers is found subtle, brightest wit of an order to be enjoyed by children of a larger growth. There are bits of delicious play upon words, such as "The Butterscotchmen," the "Giant Badorful," etc. And the verses which are scattered through this fascinating narrative are such as cast Mother Goose's inane jingles far into the shade. Take for instance, Mother Hubbard's song:



"I'M A COCKALORUM," HE SOFTLY MURMURED.
From "Davy and the Goblin."

"I had an educated pug,
His name was Tommy Jones;
He lived upon the parlor rug,
Exclusively on bones."

. . . .

"And when I ventured out one day,
To order him a coat,
I found him, in his artless way,
Careering on a goat."

The book is full of the most engaging conceits, the most entertaining episodes, the very refinement of spontaneous and bubbling fun, and the most fascinating absurdities imaginable. There are glimpses of the "Arabian Nights," of "Robinson Crusoe," of pirates, and of strange people and beasts, all treated in such a fresh and bewitching way as to make "Davy and the Goblin" a mine of delight to every intelligent child fortunate enough to open its pages. To say that the copious illustrations fully carry out the author's ideas is pretty high praise, but not more than is merited. The book is most attractively printed and bound.

In the *New-York Mail*, Richard Henry Stoddard commends it as "a remarkable story, which in its way is the perfection of what childish fantastic writing should be."

"Poets and Etchers," ($10), is a combination and mutual illustration of a group of the best American poems as illuminated by very choice full-page etchings, perhaps the finest and most varied series of American etchings which has yet been made. These delicate and sympathetic works of art are twenty in number, carefully printed on fine plate-paper, and reproducing the slightest phases of the artist's thought. There are also numerous pretty vignettes scattered through the text. Among the themes are Aldrich's poem, "Nocturne," illustrated by Smillie's etching; Bryant's "The Path," with Bellows etching; Longfellow's "The Belfry of Bruges," with Colman's etching; Whittier's "Palestine," etched by Gifford; and other poems by Emerson and Lowell. Longfellow's poems of "Amalfi," "Castine," "The Flower," "The Light-house," "Woods in Winter," and "The Wayside Inn," are reproduced and illuminated in the same manner; and also Whittier's "Telling the Bees," and the "Lake-side." All the etchings were made for this book, and the large and richly bound quarto volume will be a favorite gift among the upper ten thousand, and in artistic and æsthetic circles.

"The Knave of Hearts" (12mo, $1.25) is the latest novel of Robert Grant, the sharpest and most entertaining critic of modern social life, whose "Confessions of a Frivolous Girl" is a gem of purest ray serene. The new story is amusing, wholesome, and original, and tinged with that peculiar aureale of wit and sentiment that renders Grant's literary work so thoroughly delightful.

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Boston Nov. 24th 1885.

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Alice Marie Durand
née Fleury

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By Henry Gréville. Original copyright edition. Translated from the French by Mrs. Clara Erskine Clement. $1.25.

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An acute critic recently wrote: "'Dosia' is like a Greuze head in literature, a child-woman, with frank eyes, and dimples of witchery. All the world must love her, and we welcome her daughter for her sake."

The *Literary World* thus characterizes her style: "From the first, Henry Gréville showed herself to be possessed of a keen perception of character and of what we are accustomed to call local color, and to be actuated by high and noble impulses; moreover, she had the gift of style — a style so lucid, and fresh, and sparkling, as to be compared only to the crystal current of a mountain brook. From these qualifications come admirable artistic results. The various personages that figure in her stories are flesh and blood; they live and move and have their being not only in the imagination of the author, but in that larger sphere of actuality which includes the infinite range of human possibilities. From the first, Henry Gréville avoided the seamy side of existence, and so she is charged with being too idyllic — the inevitable charge against one who prefers to represent the purities of human life rather than its impurities, the aspirations of man toward the great ideal rather than the debasing instincts that drag him down into the mire. Henry Gréville is idyllic, in the sense that most of her stories may be read with pleasure by the innocent maiden and the sophisticated man of the world; how many writers of fiction in these days have been able to attract so diverse an audience? . . . She is on record as saying that she has never attempted in any of her writings to describe a scene that she had not viewed with her own eyes. We can well believe the assertion. The delightful realism of her inimitable pictures of Russian life, and of the lights and shadows of Paris, could result only from a faithful and loving observation."

Henry Gréville was born at Paris in 1842, and went to St. Petersburg in 1857 with her father, M. Jean Fleury, a Professor in the Imperial University of St. Petersburg. She was even then thoroughly familiar with the ancient languages, as well as English and Italian. After her marriage to M. Durand, he persuaded her to devote more attention to writing, and, as a result, "*Vera*," "*Sonia*," and other famous stories soon appeared. Half a million copies of "*Sonia*" have been sold in America alone. In 1872 the Durands returned to Paris, where, after much discouragement, Henry Gréville became a regular contributor to the *Patrie, Revue des Deux Mondes*, etc., and a friend of Edmond About, Garnier, Tourguéneff, Sarcey, Feuillet, Theuriet, and other famous Parisians. Her home is on the Quai Voltaire, near the Louvre and the Champs Elysées. She is now receiving triumphal honors in the chief cities of America.

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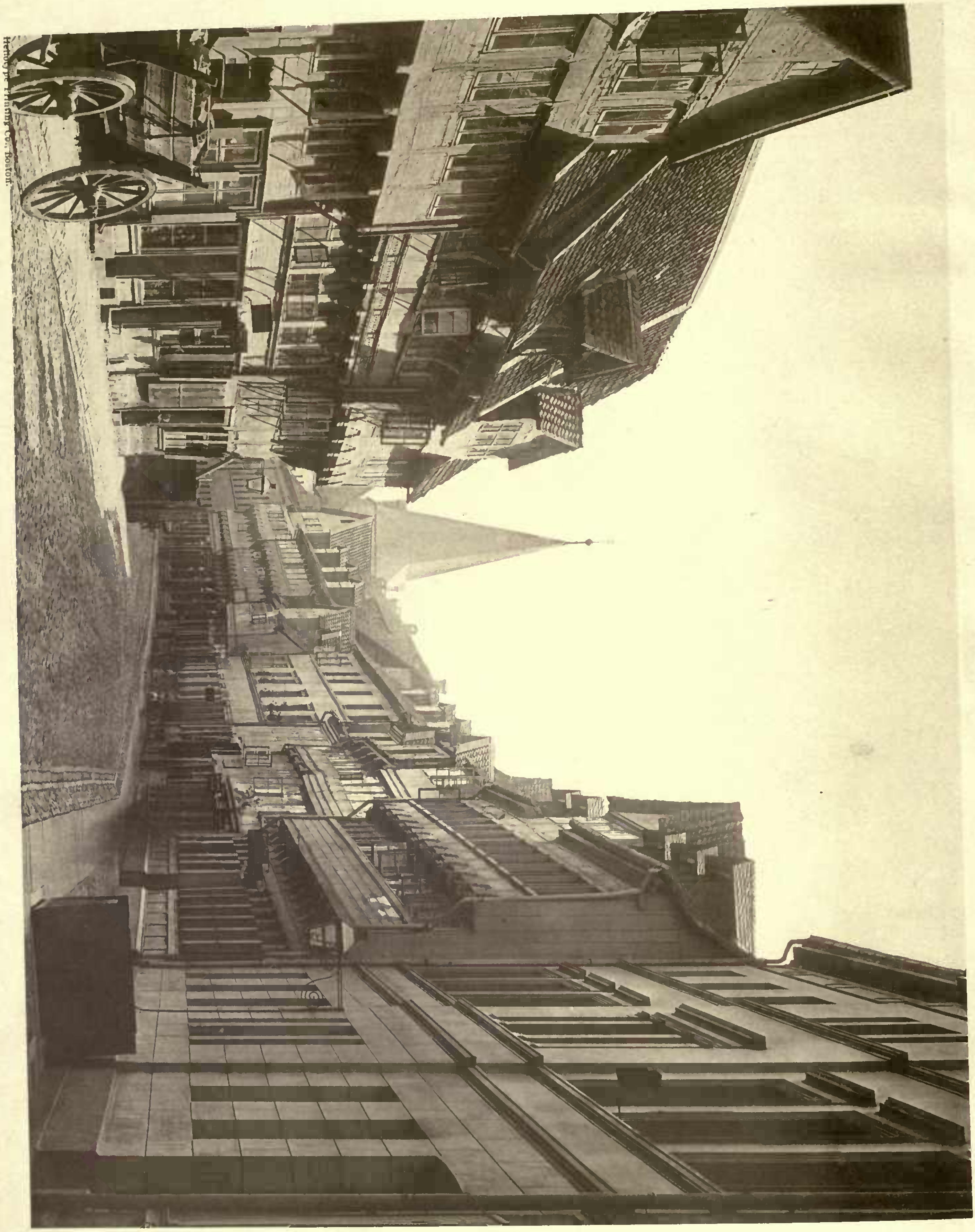
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TICKNOR & COMPANY, Boston.

THE AMERICAN ARCHITECT AND BUILDING NEWS. DEC. 26, 1885. No. 522.



A STREET VIEW IN BRUNSWICK, GERMANY.

Heliotype Printing Co. Boston.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 522.

DECEMBER 26, 1885.

Entered at the Post-Office at Boston as second-class matter.

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AS we finish the last page of the tenth year's volume of the *American Architect*, we wish to say briefly a few words for our own account. First, we wish to call the attention of those who are not subscribers to the Gelatine edition to the facts that the view of the Gate-Lodge at North Easton, which forms our "Christmas box," is a gelatine plate, and that it is the inclusion of similar plates with the ordinary illustrations that distinguishes the Gelatine from the Regular edition; and that for next year we have promised subscribers to the Gelatine edition twice the number of gelatine plates that were promised for the year just closing. It may be also of interest to state that this view of the Gate-Lodge will form one of the supplementary plates in the "*Monograph*" — in this case a misnomer, since four buildings will be treated — of the North Easton buildings now in course of preparation.

THE gelatine prints should not be confounded with the photo-caustic prints which have been issued almost every week throughout the year, the imperfections of which have subjected us to many objurgations. These imperfections are partly inherent in the process, but have been mainly caused by the misfortunes of the Heliotype Printing Company, whose failure and the consequent changes in the personnel of its establishment have brought it about, that during this year, it has been necessary to entrust the manipulation of this process to four different operators, and the result has been a succession of see-saw vibrations ranging from fair to indifferent and bad. Still we believe that the fault-finders have overlooked the many excellent plates printed by this process and which exhibited, however imperfectly, things we could have shown in no other way. If they will turn from the "Mater pia" of Luca Della Robbia in the December *Harpers' Monthly Magazine* — the result obtained through a similar process, which had the added benefits of fine paper, leisurely printing and skilled overlayings — to the reproduction of a similar Della Robbia in our issue for April 11, they must — if they can acknowledge that the art-director of *Harpers'* had justification — admit that we have not been so very wrong in holding to our belief that these views, inferior as they sometimes have been, were of more value than the material with which we could replace them. If we decide to abandon this process next year, it will be against our strong personal conviction. Any one who will take the trouble to express an opinion on this point will do us a service just at this juncture.

WE should value an expression of opinion upon another point, too. We feel that our Gelatine edition has been a success, and believe that subscribers will agree that they have not spent the extra dollar in vain. Some subscribers have asked why we do not again raise the price for the sake of being able to make the journal correspondingly more valuable. As there is nothing that would be more enjoyable than to be able to bring our work up to the highest level of our possibilities, we will ask how many subscribers there are who would be willing to pay, say, ten dollars for a journal which should be relatively as much better, price for price, as the present Gelatine edition is better than the Regular? We can hardly do more than is now done, for sheer lack of the wherewithal to do it with.

AND here is suggested a topic which is too important to neglect. The subscription price has remained the same that it was ten years ago — when no one objected to its being too large — and yet the journal has been increased in size and consequent cost, till now it costs us more to place it in a subscriber's hands than he pays for it. This is only possible by reason of our advertising *clientèle*. But it is not fair to say that the journal is maintained by its advertisers any more than by its subscribers; the support of either class is essential, not only to the prosperity but to the very existence of the journal, and the two interests act and react on one another very delicately. If advertisers drop off, we must diminish the quality and quantity of the material served to the subscribers; and if the subscribers drop off, the advertisers do not get the circulation they pay for, and so quickly follow suit. The point we wish to make is that it is in the subscribers own interest to let advertisers know that they appreciate and value their advertisements. We have to contend against a fact that does not affect other similar publications, namely, that the bulk of our subscribers, the architects that is, are not *consumers*, and, consequently, do not have to make personal application to the advertisers. So it happens that advertisers do not "hear from" their advertisements as frequently as from advertisements in journals whose subscribers are themselves purchasers — purchasers often under direct instructions from the controlling architect. If our subscribers would, once or twice a year, when drawing a specification, drop a postal card to an advertiser, saying that they had called for his wares because of having become familiar with his name in our columns, we think it should be plain from what we have said above, that of the benefit accruing to three parties by such a step, their own share would be at least enough to pay for the trouble — and the postal card.

A CORRESPONDENT of the *Builder* gives some details in regard to the customs of the modern Greeks in regard to the burial of the dead, which have a certain value in archæological study. Although the modern Greeks are believed by some to be mainly the descendants of the Tartars or Scythians, whom the countrymen of Pericles and Phidias knew only as savage cannibals, their ancestors seem, after their conquest of Greece, to have adopted the manners and customs, as well as the language of the conquered country; and the Athenians of the present day pride themselves as much on their relationship to Socrates and Themistocles as if they had been developed in a direct line from the Attic grasshoppers. Whatever may be their descent, however, their traditions are now purely Greek, and, especially among the common people, a funeral ceremony is probably very nearly the same as it would have been in the time of the Persian Wars. According to the *Builder's* correspondent, a law-student at Athens died suddenly at the hotel at which he lived, and funeral ceremonies were held over his corpse before it was embalmed for transportation to his home at Corfu.

THE first part of the ceremony was to wash the corpse with vinegar and water, this being the Athenian version of a custom which varies somewhat in different parts of Greece, wine being used instead of vinegar in many places, and a decoction of rose-leaves, made from flowers brought by friends of the deceased, in others. After washing, the corpse was wrapped in white linen, and a new suit of clothes put on, and under the head was placed a pillow filled with lemon leaves. A bunch of violets was placed in the mouth, and a wreath of fragrant white flowers around the temples. In the palm of one hand was put a small coin, to pay St. Peter, as the attendants said, for admitting the departed one to heaven, just as the ancient Greeks and Romans furnished their dead with money to pay Charon for ferrying them over the Styx. The corpse was then removed, feet foremost, from the house, the neighbors breaking glasses of water on the doorsteps as it passed out, and was taken to the mortuary chapel at the cemetery, where it was laid carefully with its head to the east, to await its final removal to Corfu. In ordinary cases a light is kept constantly burning over the grave for three years; and every Saturday the Athenian poor people bring to the cemetery bread and meat for their deceased

relatives. The idea of the modern Greeks seems to be that until the body has decomposed in the earth it needs care and nourishment, and delay in decomposition is regarded as evidence that the deceased had sinned in some way, or had not had the benefit of the prayers of his surviving friends.

A SUBSCRIBER to *La Semaine des Constructeurs* describes some singular notions in regard to the effects of moonlight upon various materials, particularly those employed in building, which prevail in the French provinces. Several writers on matters of construction, including Viollet-le-Duc, have adverted to the opinion common among masons, that moonlight produces a sort of honeycombing of the surface of certain kinds of stone, "owing," as one of the architects of the last century says, "to the dampness and coldness of the moon's rays." Viollet-le-Duc prefers to lay the damage which incontestably occurs on the south side of buildings constructed of porous stone to the rays of the sun, rather than those of the moon, and explains it by pointing out that the sun's rays often, in winter, cause violent changes in the temperature of dark stone placed in its light, sometimes raising the surface in a few hours from far below the freezing point to a degree of warmth quite perceptible to the hand; so that the south side of walls or columns undergoes strains from sudden expansion and contraction which are not felt on the shaded side. The French country people, however, do not share this opinion. Among the women it is regarded as a well-known fact that moonlight is not only more injurious than sunlight to the complexion, but that silk and woollen materials are faded more rapidly by the moon's rays than by the brightest sunshine; while the men think it only natural that an agent so powerful in its effects upon these substances should act unfavorably upon stone. Many of them, indeed, go much farther, and attribute to the moonlight an influence upon iron hardly less baneful than its effect on stone; and many poor farmers, who have no sheds under which to shelter their wagons and iron tools, build rough screens facing the south, behind which all their ironwork can be protected from the moonlight. It is still supposed by thousands of French farmers that the rays of the full moon in spring burn the leaves of their growing vegetables; but this notion has been satisfactorily explained by the observation that in clear nights in spring the radiation of heat from the leaves of plants near the ground is often so rapid as to chill them below the freezing point, so that they become curled and brown even when the temperature of the air over them is considerably above freezing; and it is probable that some of the injurious effects attributed to moonlight upon other objects may be accounted for in the same way. Every one knows that dew will rust iron and steel more rapidly than almost any other natural agent; and as a screen of any kind interposed between a wagon or plough and the sky would, by intercepting the radiation from it, prevent the deposition of dew upon the metal, it can easily be seen that such a screen might, during the clear nights in which dew is formed, serve as a valuable protection to the farmer's tools without reference to the shade which it would afford from the moon's rays.

THE *Revue Industrielle* gives an account of several new inventions, some of which are curious. Among the more useful ones are devices for improving the Thomas-Gilchrist basic process for dephosphorizing iron, and for refining the lubricating oils made from petroleum. The first improvement in the basic iron process consists in lining the furnace or converter with bricks of very pure carbonate of magnesia, brought from Syria. These bricks are said to have been used for treating ores containing three per cent of phosphorus, and to have lasted six or seven months, in furnaces melting thirty tons of iron a day. The second improvement, invented by a German chemist named Blum, consists in adding carbonate of soda in place of lime to the basic lining of the Thomas-Gilchrist converter. The effect of the substitution is to produce phosphate of soda in the slag, in place of phosphate of lime; and the phosphate of soda, being soluble in water, is dissolved out of the slag, evaporated to dryness, and sold as a fertilizer. The process for purifying mineral lubricating oils consists substantially in adding to the raw oil a small quantity, varying from one to five per cent, of permanganate of potash. The oil is then slowly distilled, and then treated with sulphuric acid followed by caustic soda. More permanganate of soda is then added, and the oil is again distilled, and treated with sulphuric acid and soda a second time. It is then nearly free from oxidizable substances. The third invention is rather amusing than useful, but it has the merit of being original. The subject of it is a clock, which has recently been patented in France. In appearance the clock consists of a tambourine, on the parchment head of which is painted a circle of flowers, corresponding to the hour signs of ordinary dials. On examination, two bees, one large and the other small, are discovered crawling among the flowers. The small bee runs rapidly from one to the other, completing the circle in an hour, while the large one takes twelve hours to finish the circuit. The parchment membrane is unbroken, and the bees are simply laid upon it, but two magnets, connected with the clock-work inside the tambourine, move just under the membrane, and the insects, which are of iron, follow them.

LIEUTENANT ZALINSKI, who, as our readers will remember, endeavored to make a scientific test of Mr. Keely's renowned motor, but was somewhat unceremoniously repelled by the great inventor, seems to have revenged himself by appropriating a suggestion derived from Mr. Keely's exhibition of his etheric air-gun; and has distinguished himself by producing a cannon in which condensed air is employed for throwing projectiles filled with dynamite or nitro-glycerine. The great obstacle to the use of such projectiles in ordinary cannon consists in the danger that the nitro-glycerine will be exploded by the shock of firing the cannon, and will burst in the gun. Although, with very light charges of powder, dynamite shells have been successfully thrown in the ordinary way, the usual charge has, we believe, never failed to explode the shell in the gun, of course, destroying it. By using condensed air, however, as Lieutenant Zalinski does, for propelling the shell, the velocity, and the consequent shock to the shell, are under control, and the movement may be as gentle or as violent as desired. By using a long gun, and admitting the condensed air behind the shell by degrees, a great velocity, and with it a considerable range, can be obtained without any dangerous shock to the projectile. At a recent trial of Lieutenant Zalinski's gun, described in the *Scientific American*, three projectiles loaded with dynamite were thrown to a distance of about two miles. Two of the projectiles exploded on striking the water, throwing up lofty columns of spray. One shell was charged with fifty pounds, and the other with one hundred pounds, of dynamite. The air for propulsion was admitted at a tension of one thousand pounds to the square inch, which, if not equal to the pressures of interatomic ether in Mr. Keely's machines, seems to have been quite sufficient for the work required.

M. CHARLES GARNIER, who is very clever in many ways, recently sent to a rifle club, of which he is an honorary member, a sketch of the catafalque constructed under the Arc de Triomphe for the funeral of Victor Hugo, accompanying it with a few lines of poetry, which are well worth quoting. Independent of the pretty turn of the verses, the sentiment of them is so sincerely modest and patriotic that we are proud to call attention to the fact that their author is one of the most distinguished and able architects in France. We should be glad, for the benefit of our readers who have forgotten their French, to give a metrical translation which should not do too much injustice to the original, but we confess that we tried to compose one, with indifferent success, and concluded, rather than inflict either that or a bald prose rendering upon our readers, to leave the French lines unmolested. The poem is as follows: —

Aux Membres de l'ecole de Tir de Bourmont.

Tel qu'un caillou rugueux en un chemin jeté,
Mon nom s'est égaré sur la route infinie
Qu'un poète géant, un immense génie,
Suivit en s'envolant vers l'immortalité;
Et je garde un reflet de la clarté sans tache,
Lumière jaillissant du sillon radieux;
Comme au Couchant la nue, en flottant dans les cieux,
Garde encor le reflet du soleil qui se cache.
Eh bien! c'est ce reflet, un jour sur moi fixé,
Que j'apporte aujourd'hui vers les confins des Vosges,
Dans les près verdoyants où s'empourprent les sauges
Du sang qui, sur le sol, à leurs pieds s'est versé,
Ce monument d'un jour pour cette âme éternelle,
Avec les grands héros venant fraterniser,
Vous dira que celui qui vint y reposer
Fut toujours du pays vaillante sentinelle.
Il aima sa patrie et crut à l'avenir.
Ainsi donc, à vous tous qui defendez la France,
A vous tous qui vivez encor dans l'espérance,
A vous, soldats français, j'offre ce souvenir.

A RETROSPECT.



Brass handle & escutcheon from The Cabinet Maker, Lond.

WE have smiled many times during this tenth year of the career of the *American Architect*, when we have thought of the first of the several crises through which it has passed: this one culminated at the end of its first year, when the matter for the first issue of the second year was ready to go to press, and the question to be decided was, Shall it go? It was suspected that when the books should be balanced a deficit would be discovered, but had any one known the real magnitude of the year's loss, number fifty-four and its successors would never have seen the light.

That the decease of the *American Architect* at that time would have been a very serious disaster to the profession and to the architectural progress of the country at large, we believe no one will dispute, and while we will not waste time in drawing imaginary pictures of what the architectural work done in the country to-day would have been had it not been for the assistance afforded by this, or a similar, journal, it may be well to inquire what, if anything, has been accomplished by it, which but for it would have remained undone. First let us disown all intention of arrogating to ourselves any unwarrantable claim to be an all-important causative power in the advances in architectual art in this country which the last decade has witnessed.



A View in Bucharest.

In 1875 the condition of things was this: there were perhaps a thousand or two architects established in various parts of this enormous country, those in the smaller cities working as best they could without intercourse with or encouragement from their fellows in other places, not knowing where to go or to whom to turn in those emergencies when one's own powers fall short of what they are expected to accomplish. Inter-communication there was none, except through the new chapter organizations and the scantily attended annual conventions of the American Institute of Architects, then only a dozen years old, and the columns of the *American Builder*, a monthly publication more suited to the needs of the master-builder, than to those of the more liberally educated architect. To this must be added the "*Sketch-Books*," of which our own journal is in a manner the heir and successor.

One thing, then, that has been accomplished has been the introduction of many of the architects of the country to their fellows in this country and in other parts of the world, and this introduction has been more than a making of names familiar as household words; it has, thanks to our illustrations, associated names with works, and has helped to build up reputations and fortunes for men who would possibly have been less speedily successful without such help.

In spite of the business depression existing at that period, the architectural interests and the general art culture of the country felt the present need of the establishment of an architectural journal, and this feeling which had existed for a number of years, shared the general quickening impulse felt all over the country, where preparations were making for the exhibits to be sent to the Centennial Exhibition. At that time every one was trying to imbue his exhibits with as much of art as his instinct or training made possible, and was consequently in just the receptive frame of mind to appreciate the lessons taught by the exhibits of better-trained fellow-countrymen or foreigners. This general stimulating of the public feeling for art resulted, for one thing, in producing a more appreciative and amenable class of clients, who were willing to encourage their architects with more than mere money in their endeavors after real architectural achievements. The stimulus received at that time was enormous; the result might possibly have been the same without the help of the *American Architect*, but we cannot but feel that it was of immeasurable advantage to the country, that just at this time a weekly journal was established which afforded the profession a means of instructing the public in matters of architecture and a vehicle of mutual inter-communication, education and encouragement. The fact that the *American Architect* is a power with the people seems a just inference to draw from the regard that is entertained for it by those great teachers of the people, the leading daily newspapers. We have no hesitancy in speaking of the rank which we feel the journal has achieved for itself, because we look on these volumes standing before us, which grow more and more portly year by year, not as on our own work, but as the work of the profession, and our appreciation of the result is purely impersonal.

Besides its function as purveyor of information, the journal performs the important function of part educator of the young men who are to be the architects of the future. In truth, we are conscious of making more effort to help the generation which follows after, than that which precedes us, and we believe the lessons our pages have contained are even now bearing fruit in the work of that younger generation of which the writers in the non-professional periodicals of the day have so much to say.

How far anything we have said or done has had any direct effect on the founding of the several schools of architecture which have followed, during this decade, the example of that attached to the Massachusetts Institute of Technology, founded in 1867, cannot be told; but we believe that no inconsiderable portion of their support and growth is indirectly caused by the existence of such a journal. The growth and development of these institutions which indicate the spread of interest in the constructive arts and sciences, finds a parallel in the birth and growth of many periodicals of varying interest and value which during the period we are considering have sprung into being, and, as a rule, have justified their right to existence, some of them with eminent success. We speak here not only of architectural and building papers, but of all classes of art journals. A glance at the list of such journals established since the centennial year would give interesting evidence of the strength and growth of the new artistic impulse which now possesses this country, and the wide range of interests covered. Until we understood more of the real strength of the art movement, we confess that we felt more or less trepidation every time we heard that a new periodical had been established to foster the interests of some special department of art to which we had been in the habit of giving its fair share of our attention; but we have invariably found that any special loss was soon made up through the general educational influences radiating from a new centre, and awakening an inquiring interest in new minds. This encroachment, as we at first thought it, on what we considered rather our own preserves, and by journals nominally devoted to so widely differing specialties as sanitation and decoration —though why we should speak of these interests as widely separated when there is an English journal styled *The Plumber and Decorator*, is difficult to say—show how broad is the field we undertook to cultivate, and of which we still hope we do not neglect entirely any portion. We have tried to give the journal the broadest and most liberal scope, and shall continue on the same plan.

Few know the difficulties that beset the path of the amateur journalist—as we were ten years ago,—or the unceasing round of grinding effort that makes the professional editor too often a creature of routine, and somewhat callous alike to praise or blame. The few who do know and have helped, now feel that we have learned the ropes at length, and have, to a certain extent, withdrawn that active coöperation which we so much valued. The weekly appearance of the *American Architect* long ago ceased to be a phenomenon and became a matter of course, and the standard applied to matters of course is rigidly applied to it: that is, people are less ready to condone shortcomings than at the outset, and expect from us a perfectness of

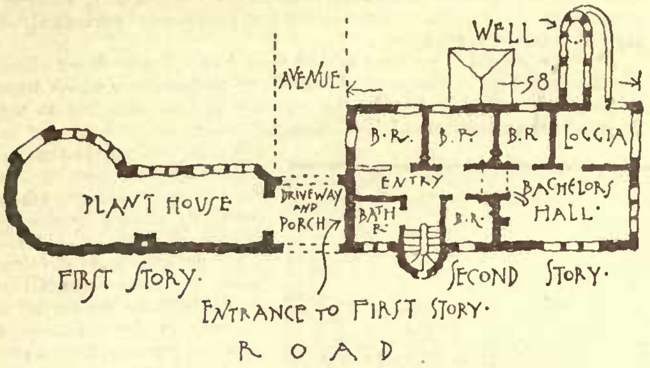
performance which is really only realizable where there is active and constant coöperation with the editor on the part of the profession he serves. This has its bearing on the fact that our illustrated pages ought to form the record of the best work done in this country in the last ten years; if they do not constitute such record — and they certainly do not — the responsibility for the imperfections rests not with those who have contributed, nor with us, who have made constant effort to accomplish this very desirable result, but rather with those who have refrained.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

GATE-LODGE TO THE ESTATE OF F. L. AMES, ESQ., NORTH EASTON, MASS. MR. H. H. RICHARDSON, ARCHITECT, BROOKLINE, MASS.

[Christmas Gelatine Plate.]



THE construction and material of this singular and amusing structure are sufficiently indicated by the view itself. The chief feature, the great entrance archway, is not shown in this view, for the reason that the "*Monograph*," from which this plate is borrowed, will contain an additional plate which does show it. The interest in this view centres about the "bachelor's hall," with its large protecting hood, its loggia, and the two-story well-house, to either floor of which an oaken bucket delivers water in the simple, old-fashioned manner. The plant-house on the left is a one-story structure, for the summer storage of winter-flowering plants.

A STREET IN SEVILLE, SHOWING THE GIRALDA TOWER. AFTER AN ETCHING BY A. H. HAIG.

THE etching from which our reproduction is made, measures 13¾ x 27½ inches, and was first exhibited at the Royal Academy in 1884. It may interest some of our readers to compare the view of the Giralda tower, given in this plate, with Mr. Ipsen's drawing of it which was issued (with description) in the *American Architect* of December 21, 1878. The etching shows the famous tower from a point of view other than that usually chosen.

Haig pursued a course of studies in architecture, combined with water-color painting, in London, for some eight or nine years — a period of training agreeably and profitably varied by occasional journeys to France, Germany, Belgium and Italy. Although a student and practitioner for so long a term, he did not begin to exhibit on his own responsibility until he had passed his thirty-second year. He describes himself as mainly self-taught, "not so much from choice as through force of circumstances; and this applies especially to my work as an etcher."

"As to my method," adds Mr. Haig, "It is simply pure etching on copper in the old manner, with such variations as are necessarily peculiar to each artist. It is, in my case, nothing but honest drawing and etching throughout, with very little 'dry point.' Not that I object to dry point; on the contrary, it is often very beautiful; only I do not need it much.

"My work is merely an expression of what I think and feel on the subject of picturesque architecture in combination with figures, and depends for its results purely on drawing with the needle, as true as I can make it, and on a thoughtful use of the acid."

S. MARIA DELLA SALUTE, VENICE, ITALY. BALDASSARE LONGHENA, ARCHITECT.

THIS building, apart from its general attractiveness, which is well interpreted by the drawing, should form one of the shrines of the architectural pilgrim to Venice, for here now lies the dust of Sansovino, whose remains were removed here in 1820 from the church of S. Geminiano, where they had rested for two hundred and fifty years. The church itself was erected in accordance with a decree of the Senate in 1631, to express the gratitude of the surviving citizens that they had escaped the fate that overtook 60,000 of their fellows. The building is octagonal in plan, with a large Lady Chapel of similar form opening from one of the sides. The monolithic columns supporting the vaulting of the choir are from a Roman temple at Pola, a town at the extremity of the Istrian peninsula.

HOTEL DE BEAUGENCY, LOIRET, FRANCE. SKETCHED BY M. FRANCOIS ROUX.

THE drawing here reproduced has this history: Five years ago it was received, together with a letter from M. Roux, who desired to make further contributions. Unfortunately, the letter was lost before we had found time to make the proper acknowledgment and response, and in this way all clue to the address of the artist was lost. Believing that sooner or later some inquiry would be made as to the receipt of so excellent a piece of workmanship, we have refrained from making use of it; but nothing has rewarded our abstention. We now make use of it in the hope that it may fall under the eye of M. Roux, or some friend, who can supply the missing address.

MONUMENT TO THE MEMORY OF WILLIAM WASHINGTON GORDON, SAVANNAH, GA. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, BOSTON, MASS.

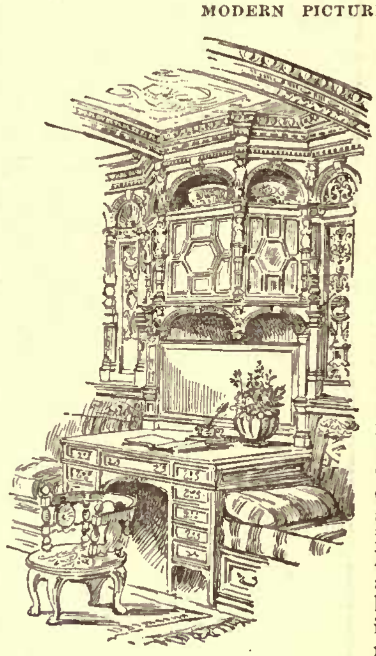
THIS structure was erected by the Central Railroad & Banking Company of Georgia — now one of the leading organizations of that State — to commemorate the efforts of its first president, to whom its present prosperity is so largely due.

A STREET IN BRUNSWICK, GERMANY.

[Gelatine Plate, issued only with the Gelatine Edition.]

NOTES FROM ENGLAND.[1] — V.

MODERN PICTURES. — III.



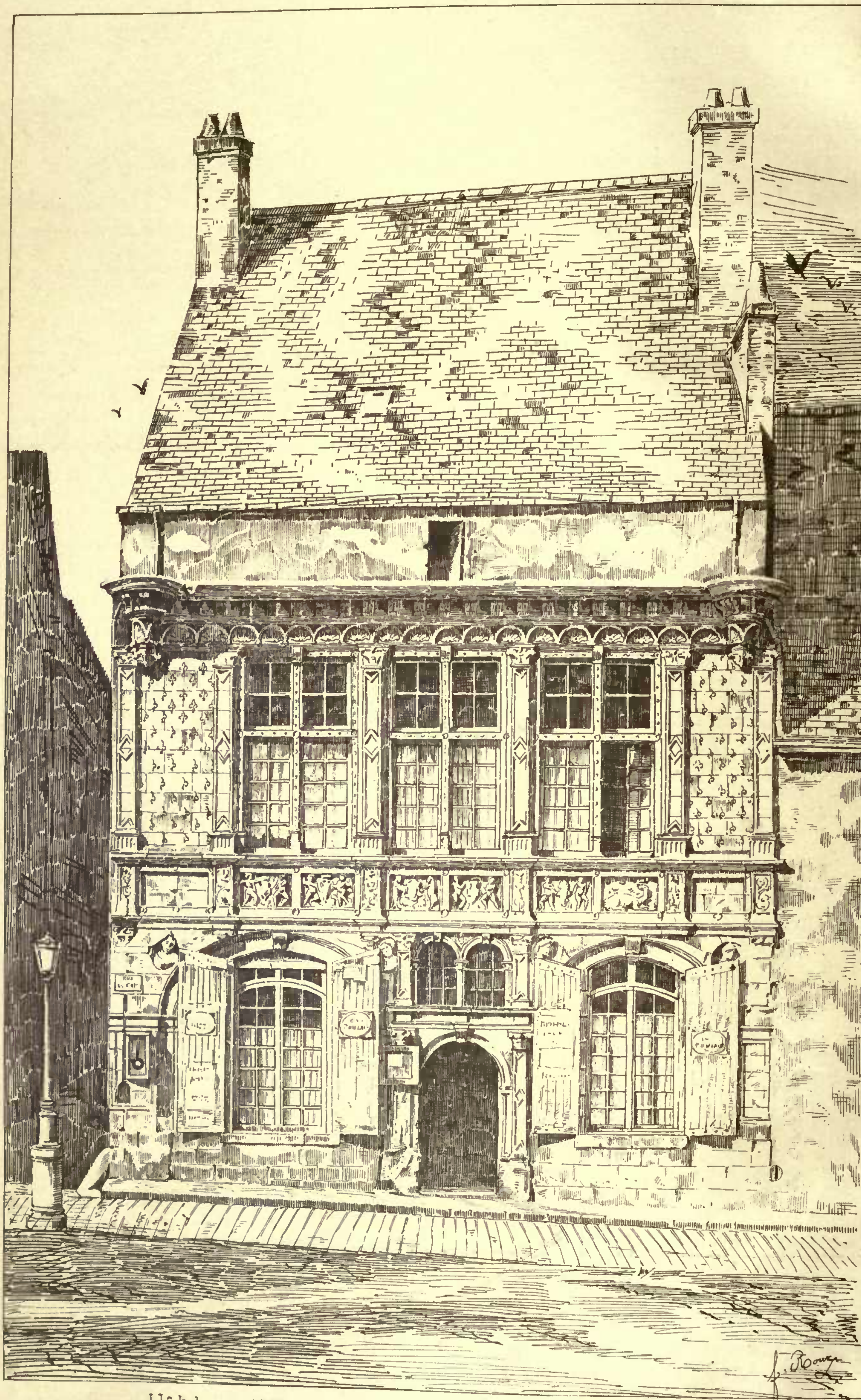
'Writing Desk' in Cabin of Sir A.B. Walker's Yacht. George & Peto Arch'ts London, Eng'd

I AM almost tired of dwelling on the same point, but I must say of still another painter — of Mr. Orchardson — that those who see only his poorer works (among which I cannot but include the much-lauded "Salon of Madame Récamier" in this year's Academy) can have no idea of the quality of his best. In his "Hard Hit," which is the specimen Mr. Roberts fortunately owns, the scale is somewhat smaller than the artist often adopts, and the streakiness of touch which is his greatest technical defect is (perhaps for this reason) less conspicuous. Here, as so frequently elsewhere, Mr. Orchardson has placed his scene in the "empire" period; and here at least he has wrought an excellent harmony with the light, bright colors it supplies in costume and interior decoration — the litter of playing-cards which strews the entire floor working effectively into the general scheme. But the chief interest of the picture is not coloristic but dramatic. No picture could tell its tale more instantly or more forcibly than does this, through the attitudes and expressions of the three men who are seated at the card-table in the back-ground, and especially through the action and expression of the younger one, who is opening the door to leave his ruin behind him. Yet it is all told in the simplest, most artistically reticent, way, without the least atom of theatrical grimace or attitudinizing.

A small picture called "Success" — a wounded duellist entering a coach and leaving his antagonist stretched upon the field — should not be passed without a word, for it is an excellent piece of work (rather French than English in feeling, however), beautifully drawn, and very strong in facial expression. A favorable example of Mr. Luke Field's talent was a small portrait head of his wife, tenderly yet very broadly handled in delicate pale tones. Mr. Boughton was represented by his well-known "Sonwin Spring," the most entirely satisfactory work of his I have chanced to see; and Mr. Briton Riviére by two or three small pictures of dogs, and the large water-color of Circe and her swine, which is also thrice-familiar through many reproductions.

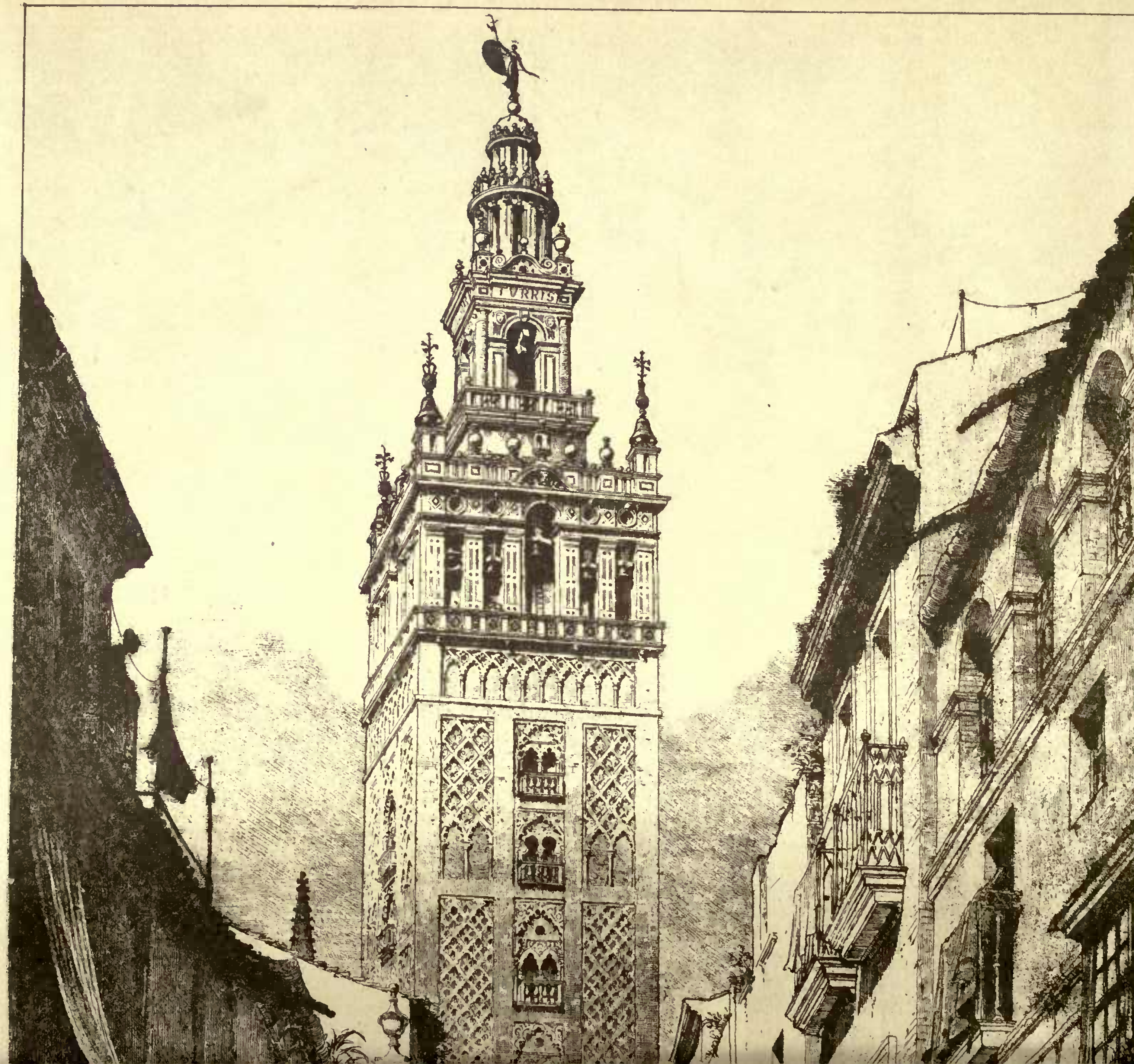
But it was more interesting, perhaps, to discover, amid all these famous names, a new artist with a new and striking personality, and one which seemed to me to unite the best qualities of current French and current English practice. I say a new artist, for while Mr. Gregory has been known to the amateurs of London for a number of years, his reputation is not yet what it deserves to be — a reputation familiar to all who care for contemporary art. He is one of the many English painters who began with illustrative work. (Frederic Walker, by the way, made his *début* under Thackeray's wing.) For

[1] Continued from page 293, No. 521.



Hôtel-de-Ville de Beaugency. Loiret France.

HELIOTYPE PRINTING CO. BOSTON


TURRIS

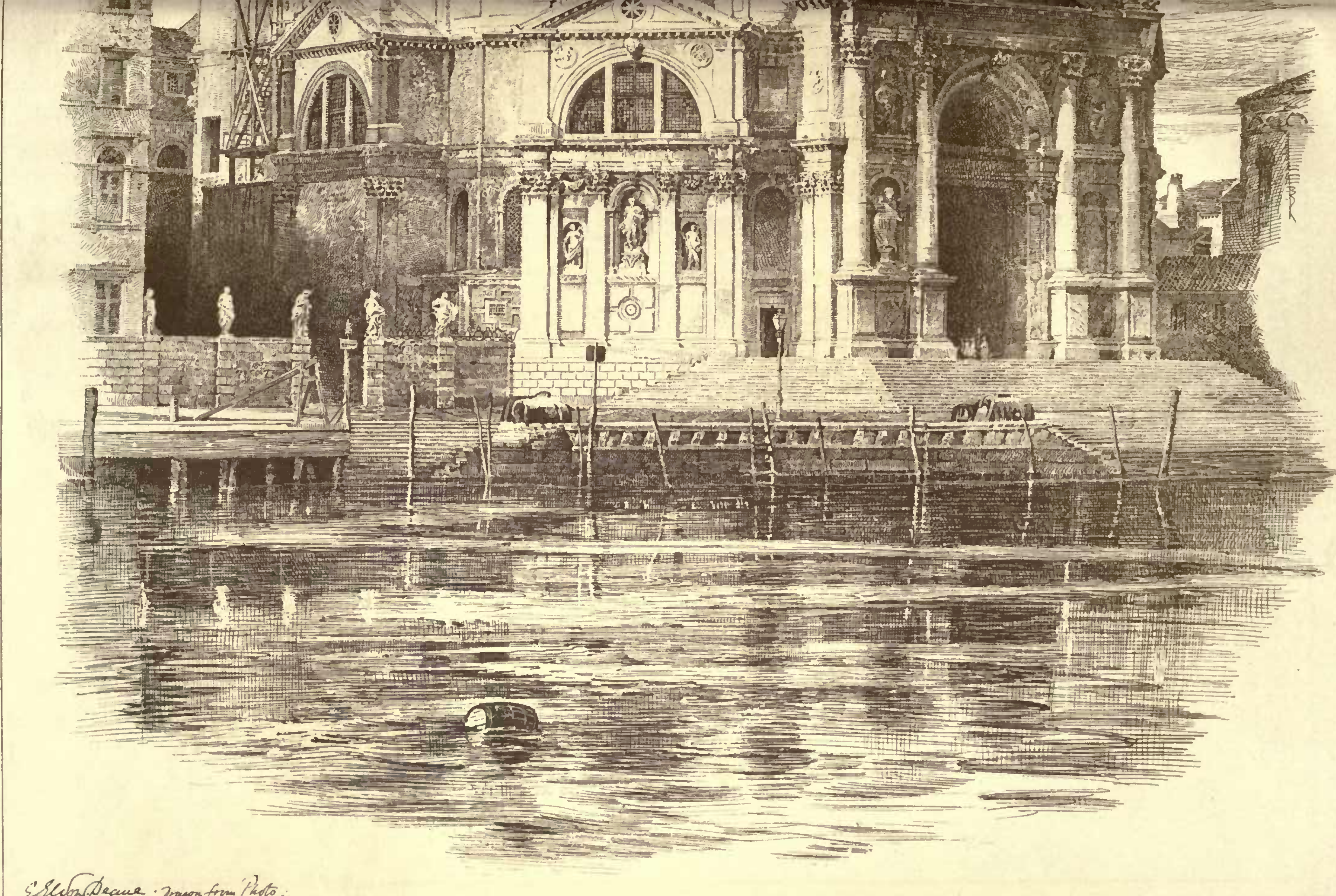


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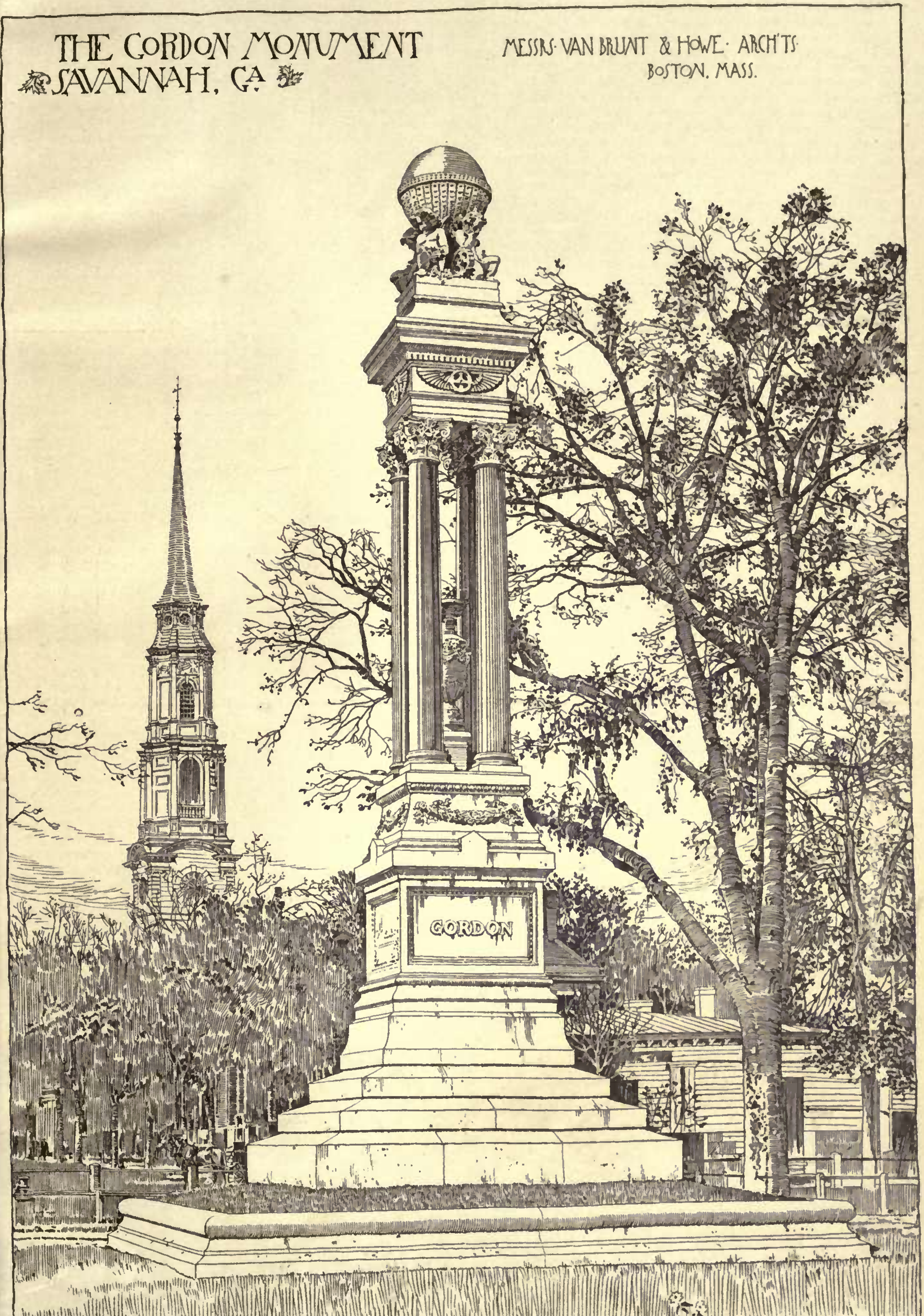
The Giralda, Seville, Spain.

American Architect and Building News, Dec. 26 1885





HELIOTYPE PRINTING CO., BOSTON.



HELIOTYPE PRINTING CO BOSTON

many years he was a prolific contributor to *The Graphic*, and thus fostered what was doubtless a natural bent toward the representation of contemporary life in its non-rural phases. I have seen only a few of his pictures — most of them, I believe, are in a private collection at Manchester; but the one owned by Mr. Roberts, and rightly esteemed by him as a treasure among treasures, would by itself suffice to put him in the very front rank of English painters. It is called "Piccadilly on a Drawing-Room Day," and shows the long, sunny, misty, crowded thoroughfare in outstretched perspective, as seen from a second-story window on the corner of Bond Street. A prosaic enough subject, you will say, and of a sort we are more apt to find on a French than on an English canvas. French-looking, too, I should add, is the singularly brilliant brush-work, marked by rapid precision and nervous strength, by facility combined with sureness, and vivacity uncombined with restlessness or over-emphasis — qualities we scarcely ever find in English technique, even when it is at its best; almost never, perhaps, except in Mr. Millais's pictures, and then so differently put to service that a comparison is quite out of the question. Add to this brilliancy of technique a tone that is perfectly kept; color that is truthful yet delightful; accomplished draughtsmanship; unusual power of composition, and great dramatic expression in all the little crowding figures — absolute life and individuality in gesture and in face, and I shall have said something to explain how this picture equals the best of its kind from any land. But I shall have said nothing to explain why it seemed to me better than the best I could remember even among those from France. It had in addition to its material qualities a thoroughly English quality of *charm.* One hardly knew how sentiment, feeling, had been put into so "realistic" a rendering of so unpoetic a theme. But it was there — possibly in the way the atmosphere was painted, with a marvellous sense for that peculiar suffusion of light and palpability of air which exists if a strong afternoon sun strikes through the London mist when a wind has blown it thin but not blown it quite away. It never *is* blown or evaporated quite away, let breeze and sunlight do their best; and this fact makes London — to a superficial eye so much "uglier" than Paris — more attractive to a painter's eye. For this eye sees the air which common folk merely look beyond, and knows what it means as an element in painting. Only, there are very few painters who could render it as Mr. Gregory has, without exaggeration, and there are very few, moreover, who could put the strong scarlet of a single soldier's coat into the very foreground, so as to vivify yet not disturb the quieter, subtiler tones about it. Towards absolute "realism" of motive and of treatment, all contemporary art is surely trending. Our gratitude is due, indeed, to those who can show us that it need not mean lack of pictorial feeling, lack even of poetic sentiment and grace.

Some of Mr. Roberts's water-colors I have already noted, and now I must pass over very many others (among them a number by North and Sir John Gilbert) and merely speak of the two painters who in this branch impressed me most strongly — not only in this one collection, but everywhere else where I chanced to see the aquarellists of the moment represented. These two were Alfred Hunt and Albert Goodwin. The former is surely among the most versatile of his fellows, passing from theme to theme, from tone to tone, from sentiment to sentiment, with a marvellously catholic spirit and a marvellously flexible art to serve it. For example, his "Lighthouse at Teignmouth" — seen from the pier at night through a driving storm — has a force and wild intensity impossible to describe; while several neighboring pictures prove that no one can paint a rainbow with such exquisite success as can Mr. Hunt, bringing its all-but-unmanageable tints into perfect keeping with the dull tones about them, yet not sacrificing aught of their brilliance, and expressing its evanescent quality with an almost evanescent grace of touch. These are but two instances of Mr. Hunt's inexhaustible variety. Many others hung near at hand, and I hope that many may hang among the specimens of English water-color art which have recently been sent to Boston. Only a long list would show the full reach of his talent, though I imagine any example would show its quality; for so far as I have witnessed, he is an exception to the rule of inequality in performance so dominant in England.

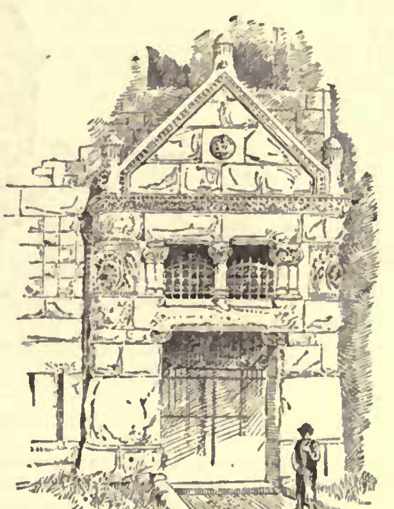
I hope, too, that Mr. Goodwin is well represented in Boston; that some of my readers, at all events, may understand what I mean when I speak of the purity and strength and harmony of his color. Mr. Goodwin lives at Ilfracombe, on the North Devon coast, and very frequently paints the picturesquely rugged shore and ragged villages and emerald or sapphire sea which he has there before him. Many examples of this sort Mr. Roberts owns, but with them others of quite other sorts, each delightful in its own way. Finest of all, perhaps, is a large picture called, I think, "Going to Church, Abingdon." A long, straight path, with homely figures traversing it, the soft sunshine slanting through the thin-leaved trees and falling on a scattered group of gravestones — it is a peculiarly English subject and is expressed with the peculiarly English sort of charm we have so often found beneath other brushes.

Leaving now this one private collection, of which I have but half told the riches, I may add that Mr. Goodwin's contributions to the Royal Society of Painters in Water-Colors were extremely interesting, showing his coloristic power very fully. Especially delightful was a large drawing of a heathery hillside, a most lovely harmony of pink and grayish notes. The gold frames upon which this association insists in its spring exhibition — I believe with the curious idea of marking the difference between the "pictures" then shown and the "studies" shown at another period of the year — damaged considerably the effect of this and of other water-colors which may possibly have gone to America. If they *have* gone there I trust they have been reframed so as to appear to fuller advantage.

I have been so garrulous already that I hesitate to speak further of the pictures which I chanced to see in London, and which I still remember as of interest. I will but note two of exceptional attraction: Mr. Whistler's portrait of the violinist Sarasate, mysterious, mystical, poetic up to (but certainly not over) the verge of fantasy, yet strong, genuine, and vividly full of life, as well as of spirituality; and Mr. Sargent's Academy portrait of Lady Lyon Playfair, brilliant, audacious, bold and yet high-bred, chiefly concerned with things material, and yet by no means devoid of soul beneath its splendidly painted exterior. The second of these portraits has already gone to Boston, and I can imagine no more interesting study than would be possible might the Sarasate hang beside it. In each we should see the consummately-accomplished work of a man who is a painter born, and in each a different — in fact, an opposite artistic mood pushed to the utmost extreme which can be held and the result yet be artistically complete. On the one hand we should see technical brilliancy, on the other technical charm; on the one hand a "realistic," on the other a "spiritual" intention. We could not *compare* the two, for there is no common ground on which they meet except the common ground of complete achievement, and this does not suffice for comparisons where the ideals in view have been so essentially diverse. But we could do better than compare — we could *contrast*, and in the act could realize how wide indeed are the limits of good portrait-art, how foolish it is to dogmatize narrowly on its requirements, to limit our admiration to workers along a single line and say, Thus and not otherwise must the thing be done if it is to be perfectly satisfactory, both as likeness-making and as pictorial art.

M. G. van Rensselaer.

TIRYNS.[1]



Side Entrance to the Spiritual Temple
Boston, Mass. ... Richardson
Architects

THE story of Dr. Schliemann will always remain a romantic episode in the history of archæological research. Certainly, antiquarianism was never before so happily stimulated and so generally enlivened by an enthusiasm which, not in virtue of old experience, but of boyish day-dreams, did in result attain to something like prophetic vein. The solitary broodings of a boy who rose at five o'clock to sweep out a shop in which he was to retail herrings over a counter, gave form to a desire — it may almost be called a resolve — to bring himself into personal relations with the heroes whose images emerge magnified among poetic mists along the horizon of history. So resolution was nerved to achieve fortune first, and then to employ fortune with triumphant success upon an enterprise which many — among them Lord Sherborne with his pert quotation "*etiam periere ruinæ*" — thought a craze.

The hill of Hissarlik was trenched from side to side, and uncovered through successive strata to reveal the ruins of a strongly-fortified citadel — strongly for an early time — on the banks of the Scamander, and within sight of the traditional moorings of the fleet of Agamemnon and "the princes argulous," his confederates. From the débris which bore witness to a catastrophe aggravated by conflagration was recovered a treasure of utensils and ornaments in the precious metals which testified that the city, at the height of its prosperity, might well have contained wealth sufficient to be a bait for the predatory passions which are the instincts of military monarchies of all ages. Such a discovery was no more than the explorer was quite prepared to expect. What wonder if he accepted it as verification of all the rest of his expectations. What wonder if the enthusiast saw in the feminine head-dress the very ornament that Andromache tore from her hair when she saw Hector barbarously trailed in the dust behind the chariot of Achilles, and in the golden cup, the very same out of which Hecuba poured the libation, when she, with heavy heart, dismissed Priam on his mission to recover her son's body from the ruthless Achilles.

The next enterprise seemed naturally complementary, as naturally successful. On the very citadel of Mycenæ, abounding in gold, the enthusiast discovered, as if by instinct, sepulchres filled with sixteen

[1] "*Tiryns;*" the Prehistoric Palace of the Kings of Tiryns. By Dr. Henry Schliemann. Murray, London.

or seventeen corpses, which, by the splendor and the sumptuousness of accompaniments, could only be royal. The signs were indisputable of interment of all at one time. Here was testimony of a slaughter of princes — on the very site, where Agamemnon, his paramour Cassandra, and a troop of his victorious comrades were slaughtered, treacherously, in his own house — slaughtered "as cattle might be slaughtered for a feast at a royal gathering."

Study and afterthought have reduced these enthusiastic combinations. Homer's story has been recognized as too much imbued with imaginative elements to be accepted as history; and the Troy of Hissarlik may have been the object, or the centre of a conflict between Eastern and Western populations; but it could only have been under very different circumstances, certainly at a time when social arts were far less developed than the poet cares to represent. But what poetry has had to surrender, history has gained. These discoveries have set before us testimony as clear as if written — of a certain stage of the arts of war and peace — and enabled us to look behind and beyond the phantasmal curtain of Homer's poetry. We now perceive that the poet, even in drawing for his contemporaries a picture of life of an earlier phase, was dealing with traditions of manners that still were modern compared with those which could have been familiar to the occupants of these more remotely prehistoric sites.

Here we have been familiarized with epochs, when hand-made pottery was only gradually receding before wheel-made, stone implements and weapons before those of metal, though at present only bronze; but in the signs how original forms of fictile vessels had become modified, and imitative shapes conventionalized into ornaments and patterns, we have intimation what considerable periods were required for such transitions: fortifications in which laboriously-worked stone could be but sparsely employed, were extended by a system of construction of sun-dried bricks, bonded by longitudinally-inserted timbers, and faced by protecting panels or planks. It was in other localities, and as a stage of advance, that Cyclopean walls of stones, only sparingly dressed by the pick-hammers, are heaped roughly together in reliance for solidity upon mass and weight.

But only in the last excavations at Tiryns have remains of dwellings been discovered which are sufficient to give complete notion of plan, and to explain the slight traces of houses or palaces which were disturbed at Hissarlik only to be partly demolished in the process of uncovering what was not at the time intelligible.

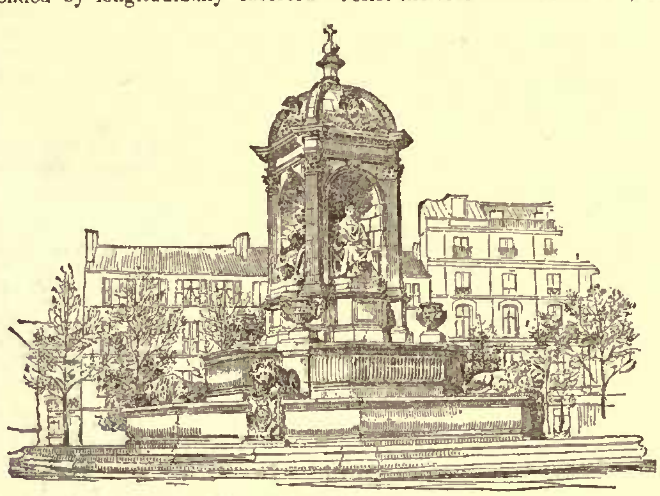
If Dr. Schliemann was disposed to claim for his former discoveries the ownership of Priam and Agamemnon, he might, with something more of right, assert for his discoveries at Tiryns the title of the Palace of Hercules. A Hercules of Tiryns as the recognized ancestor of the long line of historical Kings of Sparta is something more substantial than are the Atridæ, who represent a dynasty which only lived in heroic poetry. The return of the Heracleids — the princes of the house of Heracles — as the representatives of legitimacy, after long exile, to recover supremacy in Pelopennesus, is an event which it is as futile to disallow as an expression of an important political revolution, as the significance of a traditional invasion of England by Hengist and Horsa. Tradition placed this return as a counter-revolution at a point of transition in the history of Greece; there were ascribed to it political and social consequences as important as ensued from the conquest of England by William of Normandy, in assertion of a title derived from the Confessor.

That the early story of the eponymous hero became so marvellously varied, confused, exaggerated, and generally transformed from matter of fact to matter of fancy, does not affect the main presumption that chiefs who held their authority in virtue of hereditary claims among tribes who long continued to assign the greatest importance to descent, must have derived their importance from an ancestor who had gained power and distinction by his wealth and achievements in some early age. The history of the world is full of accounts of royal houses that have held on for generations in virtue of such associations, long after all the virtues of the founder have been extinct: after all pretentions to lead in the battle-field have become obsolete, and sometimes, indeed, after every other virtue that could give the shadow of a claim, is lost. A chance revival by a collateral is often sufficient to refresh the tradition and give fresh hold to the spirit of loyalty, or the mere habit of loyalty, which is eager for an excuse for its indulgence.

Numerous traditions, and several even in Homer, represent Hercules as a king of the type of the Homeric confederates who war against Troy. In this character he led a previous successful expedition in six ships against Troy, and in a war with Pylos he almost exterminated the family of Nestor; and the story is quite in harmony with the unscrupulous habits of such monarchs, which tells how, by a base treachery, he killed his guest, Eurytion, for the sake of his horses. A Heracles so engaged presents a striking contrast to the Heracles whose arrows wound Here herself and Hades, or to the Heracles who is the submissive servant of Eurystheus in performance of imposed labors. Here, if anywhere, the threads of legend become curiously crossed and entangled with each other; the several legendary forms of Heracles become fused with each other — the symbolical from more than one source, and the pragmatical indifferently. Hercules, as the sun, travels through the twelve signs of the Zodiac; as another type, he clears the land of destructive animals and savage tribes; another, regulates water-courses or drains swamps, and is the representative of epochs when these works of unrecorded labor and perseverance were performed. In one form Hercules is fully equipped when provided with club and lion's skin; then he is an archer; then he has sword and spear, and the elaborate panoply such as Hephæstus made for Achilles. He is now the son of Amphitryon, and now of Zeus himself.

All this is granted, and yet we come back to the point that the popular tradition of Greece — which was largely independent of embellished poetry — assigned the origin of the time-honored royal family of Sparta to a dynasty which, having once held sway at Tiryns, succumbed to the power of the rulers of Mycenæ, and afterwards returned to revolutionize the entire peninsula and supersede the Achaian by the Dorian type of civilization. And such a persistent tradition only springs up from a strong root.

Of such a dynasty, then, as ruling at Tiryns, we have now true monumental evidence; we have now a plan and considerable details of the citadel, and still more interesting, because unique, of the royal dwelling. In one main point, especially, these confirm tradition; they indicate that the power of this Tirynthian dynasty was brought to an end at a time when Mycenæ had still a long period of power and prosperity and advance in the arts before it. It is impossible to resist the inference that it was, as tradition affirms, to the superiority of this powerful neighbor that the catastrophe of Tiryns was due. The ruins of Mycenæ, its citadel and immediate dependence — in technically and decoratively elaborate tombs, and so forth — indicate, unmistakably, a series of advances of which Tiryns shows no trace.



Fountain of S. Sulpice. Paris. France.

Yet there are sufficient signs that Tiryns must have been once and at very early date the seat of very important political power. The walls are formed of colossal masses of rock, which have excited the wonder of every age since they suggested to Homer the epithet by which he distinguishes Tiryns. In their massiveness, their extraordinary thickness, in the extent of the galleries and casement-like chambers with which they are permeated, we find no sign of a stint of labor. They were assuredly built in anticipation of the possibility of very serious attack, but with a full sense of present security which allowed them to be laid out and completely constructed upon a uniform and well-considered plan, involving a continuance of vast and organized labor for its completion.

The general circuit of walls follows the line of the summit of a low hill, and encloses an area in form of a long, narrow shoe-sole. Under influence of like requirements, similar schemes to meet them are suggested. This area is distributed like that of Corfe Castle in Dorsetshire and other numerous mediæval castles: the highest ground at one end is occupied by the dwelling of the lord and offices appurtenant, with a certain extent of open court—thus the equivalents of a first and second ward. These are separated by a cross wall from the third ward, a smaller half of the area on lower ground, which would afford accommodation for a general garrison, stores, cattle and so forth. The main entrance to the fortress is on the east, from which the road branches to right and left within the walls, to the lower and upper wards. For these latter there is provided an exit by a small postern on the west. The excavations have now supplied an explanation of the galleries having a wall on one side and arched openings on the other. These arches formed by the huge stones corbelled over towards each other, admitted to chambers, vaulted by the same scheme, within the thickness of the outer wall, and serviceable for arsenals, prisons, or storage generally.

If the arrangement of the fortress corresponds with those of the mediæval castle, the palace shows a like agreement with the plan which was dictated to the Greek architect in historical times by the demands of private life and public intercourse. It illustrates Homer and Vitruvius equally. The palace is divided into a public or men's department, and what might be called that of the women, except that it was necessarily the special and secluded dwelling of the lord of the fortress and of his family. These are arranged side by side, and it is only remarkable that the communications between the two seem needlessly circuitous. Both comprise similar primary elements, though the men's side is upon a larger scale. The chief apartment here, a hall fronting south, supported internally by four pillars, is

entered from a spacious forecourt through a vestibule and then an ante-chamber.

The vestibule, of the plan known as distyle *in antis*, is omitted before the smaller hall on the other side. The forecourt represents the atrium of the later architecture, or the *aule* of the house of Ulysses in Homer. Like that *aule* it contained an altar. That this altar is the only evidence of reference to religion which appears at Tiryns, may be taken as confirmation of the statement of Herodotus, of the extreme simplicity of the early religion as contrasted with the crowded mythology of later times. The palace of Ulysses is a combination of palace, manor-house and homestead; the cattle are turned loose in the *aule*, and the floor of the chief hall is only of beaten clay, in which a trench may be dug, and the surface has to be cleaned by scraping with hoes. At Tiryns both the *aule* and the chief apartment are carefully floored with good lime concrete. The traces and remains of wall paintings, and of an enriched elaborate frieze found for the first time in these explorations, are full compensation for the absence of such finds of gold and silver and enriched ornaments and weapons as were yielded at Troy and Mycenæ.

A very remarkable feature of the plan is a bath-room in close proximity to the main hall. The floor was formed of an enormous single stone weighing over nineteen tons; it had a raised margin, and provision was made for draining-off water. The walls were panelled with wood, as proved by the remaining dowel holes.

As regards construction generally, the foundations and lower parts of the house walls were of rubble masonry set in clay mortar, above they were formed of sun-dried brick, and in some cases of the rather unaccountable thickness of four-and-a-half feet. Of the roofing there is nothing to be said, and any suggestion as to the mode of lighting can be but guesswork as absolute as in the case of later Greek temples. The smaller rooms might be lighted from the doorways or openings over the doors; but this will not serve for the chief halls which extend far back, and that beyond the ante-chamber and vestibule. The circle for a hearth in the middle of the floor of the larger hall, is proof that however smoke ultimately escaped, it had free range in the meantime. Indeed, the roof beams of Homer's palace are designated by a word (*melathra*), which is supposed to allude to blackening by smoke.

The state of the remains indicated that timber was very extensively used in the construction, and no doubt in the upper story, which can as little have been absent here as at Ithaca. Indeed, the place of the stairs seems recognizable.

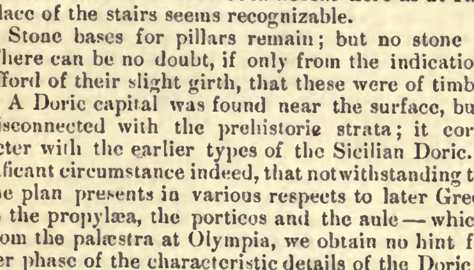
Stone bases for pillars remain; but no stone drum of a pillar. There can be no doubt, if only from the indication which the bases afford of their slight girth, that these were of timber.

A Doric capital was found near the surface, but manifestly quite disconnected with the prehistoric strata; it corresponds in character with the earlier types of the Sicilian Doric. It is a most significant circumstance indeed, that notwithstanding the analogies which the plan presents in various respects to later Greek architecture — in the propylæa, the porticos and the aule — which might be copied from the palæstra at Olympia, we obtain no hint from it of any earlier phase of the characteristic details of the Doric order. This order makes its appearance in the world with as little announcement, so far as recovered remains are in question, as though it had been invented at a stroke, and having been invented, had been accepted at once with such entire satisfaction as to invite no further organic change, no change at all indeed, except in respect of refinement of proportions.

What date, then, shall be assigned to the foundation of Tiryns upon this complete and well-thought-out design? We may say with security that it is not merely prehistoric, for Homer is that, but it is pre-Homeric also. The return of the Heracleids can be dated with much plausibility about one thousand years B.C., but this return must have been comparatively modern history to the founding of the reputed seat of their ancestor. It remains for the students of mythology to elicit from mythical tradition, if they can, some hint of at least the order of succession of the periods that witnessed the acme of prosperity of Troy, Tiryns, Mycenæ and Orchomenos.

W. WATKISS LLOYD.

THE UTILIZATION OF THE SEWAGE OF PARIS.


The Village School : Bramfield : Eng'd
from sketch by E.J. May Arch't Lond'n.

THE French Government in June, 1885, received a report from a commission charged with the examination of a project for utilizing the sewage of Paris in agriculture. Dr. Bourneville, of this commission, made an interesting and voluminous report, and of this *Le Génie Civil*, of Octob r 17, gives the following short *resumé*: —

The system of sewers of Paris is about 424 miles in length; this system absorbs the rain water (about 80,000 to 100,000 cubic metres gathered from the surface of the city), and the waste from the public lavatories and domestic and industrial establishments, and also a portion of the material from cesspools. The author calculates that each man daily produces 2.64 pounds of waste matter, of which 2.57 pounds is liquid. For the entire population of Paris this would amount to 2,860 tons, of which 2,655 tons are liquid, and 204 tons only are solids. The fermentable portion, that which at times produces infection, and includes matter that is of productive value as manure, is almost entirely confined to the liquid portions; as he figures 58,953 pounds of azote as the daily product of all Paris, and of this only 6,644 pounds is found in the solids.

At present four systems are actually in use for the reception of this unclean matter: the fixed well; the movable well or tub; the filtering tub, and its direct discharge into the sewers. The disadvantages of the first two methods are well known. The third is a new system introduced within the last fifteen years into Paris, and there are now 27,000 of these *tinettes filtres* in the city, utilized by 500,000 inhabitants. This appliance permits a liberal use of water, and has advantages over the wells, but is unsatisfactory as compared with direct water-carriage in the sewers.

Water-carriage means the immediate removal of all unclean matter in a sufficient cube of water for its transportation, before any fermentation has set in; it is employed in all the great cities of Europe, but is of very recent introduction into Paris, but now the sewers receive a very considerable portion of this material.

The infection of the river Seine, which has resulted from this new departure is already assuming serious proportions, and at the bridge of Asnieres, where the great Clichy sewer empties on the right bank, the Seine is a veritable open cesspool. The water is discolored and covered with a greasy scum; the azote reaches 25 grammes per cubic metre; the oxygen has almost completely disappeared (1 c. c. per litre), being absorbed by the organic matter and rapid decomposition; and the number of microbes is 200,000 per cubic centimetre.

The two great collectors of the right and left banks uniting at Clichy, furnish, according to the latest guaging in 1884, a daily cube of about 11,152,441 cubic feet (315,936 cubic metres), or 115,617,738 cubic metres (1,080,659,151 cubic feet) per year.

As the mean of eighteen years' observation, the waters of the Clichy collectors contain the following proportions of various elements per cubic metre: —

		Kilogr.	Kilogr.
Volatile and Combustible Matter	Azote	0.041	0.815
	Other products	0.774	
Mineral Matter	Phosphoric Acid	0.017	1.733
	Potash	0.031	
	Lime	0.351	
	Insoluble residue in the acids	0.704	
	Various products	0.630	
Total,			2,548

Dr. Bourneville then briefly discusses the various systems of mechanical and chemical utilization of sewage, and concludes that its absorption by the soil and agricultural application, as used at Gennevilliers for the past fifteen years is the best; and he proposes the extension of this system to the provincial lands of Achères, including 1,200 hectares of area. Taken in connection with land now under cultivation at Gennevilliers this would give a total of 2,200 hectares; with this area it would be necessary to purify and utilize about 59,000 cubic metres of fluid per hectare. But neighboring plains offer 4,500 hectares of irrigable soil, and can be utilized. In answer to objections advanced against the Gennevilliers system, he says, that during the coldest season the waters in the sewers preserve a temperature of 5° to 7° above zero, Centigrade; that continuous irrigation has been proven to be possible; that the soil he proposes to add is permeable, and that the present experiment is not an infectious morass as some claim.—*Sanitary World.*

THE TENDER OF PLANS.

BUFFALO, N. Y., December 15, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I think the point of "tender" of plans in your issue of December 12 was held by Illinois courts as unnecessary in a very interesting suit in Chicago in 1882–1883. C. T. Brentano, attorney there, will doubtless send you pamphlets of it on application. As the case is identical, nearly, with Mr. Matthews's, I have referred him to it, and trust it may have any space it deserves in Mr. Clark's forthcoming work on architectural law. I was present, and familiar with all circumstances of both the District of Columbia and Chicago cases, and believe you will find the latter a case worthy of even more frequent reference than the Tolman-Phelps, as affecting more usual circumstances. I believe Mr. Matthews can easily collect, and that, too, for *any portion* of the work done, though his contract was not, perhaps, completed, as heirs collect in event of architect's death for work as far as done. Yours, LAWYER.

NOTES AND CLIPPINGS.

AMERICA'S SHAM CASTLES.— There is the trouble with the American. If he has $100,000 to spend, he makes the building look like a $200,000 house. I don't suppose there is a building in Detroit that would make

a decent ruin. We build for show. We put on these abominable sheet-iron cornices, and paint them to look like stone. If we have a shingle roof we color it so as to look like slate or tiles. We put up brick buildings and thinly face them with stone. The only genuine thing, as well as the only original thing about American architecture is the pioneer log-house of the backwoods. There the logs were logs with the bark on, and the roof was of clapboards split from the oak blocks, the chimney was built of clay, and stood boldly and generously out as if it were not a thing to be hidden, but the warmest and most inviting thing about a house. The floor was uncovered boards, and the blackened beams overhead stood boldly out in the grateful light of a hickory fire blazing on the huge, ample hearth. The log-house was a product of the immediate land around it. The clay dug from the well made the chimney, the logs cut in the clearing made the house. Now we live—or try to—in an age of furnaces, of hot and cold water, of shoddy and sewer-gas, and die of malaria and diphtheria and all modern improvements. — *Detroit Free Press.*

Buckingham Palace. — If Buckingham Palace is to be kept closed, as it has been for the last twenty-four years, I think that since it is maintained (like the other royal residences) by the taxpayers, it would be well to admit the public (under proper restrictions, as at Windsor), to view the State rooms and the picture-gallery. The collection of pictures at this palace is one of the finest in the world, and not a soul ever sees them from one year's end to another. In addition to the numerous "gems" which are in the State-apartments there are enough pictures (principally portraits), stowed away in corridors and back rooms to stock half-a-dozen museums. There is also a splendid collection of miniatures, representing celebrities of the reign of George III and his successor. All these interesting and valuable objects belong to the Crown (*i. e.*, to the nation), and it is rather hard that they should be kept where nobody can see them. The Prince Consort was a zealous advocate of admitting the public to private galleries (and was, indeed, the principal pioneer of that movement), and he did everything in his power to facilitate the throwing open of the State apartments at Windsor Castle, in spite of the desperate opposition of a few pedantic wooden-headed Court functionaries. If he were yet alive, I have no doubt that Buckingham Palace and its priceless contents would long ago have been thrown open, but now, unluckily, there is nobody to represent the matter properly to the Queen. —*Truth, London.*

Housing of the Berlin Populace. — A flood of light is let in on the singular spread of Socialism in the German capital by statistics showing that in Berlin no less than 94,000 families, comprising nearly 400,000 individuals, have to live, sleep, and often work, in "suites" of a single room. In 3,000 of these rooms there is neither stove nor fireplace. One-fourth of their tenants are poor lodgers. Twenty-five thousand families live in cellars under sanitary conditions that are characterized as absolutely shocking. Such meagre accommodations as our despised New York tenements afford, with their two or three rooms to each family, are at a premium, and would be accounted a great boon by thousands. Only of the poorest and the best classes of dwellings — those renting at 10,000 reichmark a year or over — is there abundance, for the Berlin builder is a speculator, not a philanthropist. The poor have not even the chance of going to church of a Sunday, to meditate on better things to come, were they so minded; for all the Protestant churches and chapels in Berlin have together hardly seats for 50,000, while the servant girls alone number over 60,000. — *New York Tribune.*

The Preservation of Ropes. — The preservation of scaffold ropes is a matter of great practical importance when scaffolding remains erected for any considerable time, especially in localities where the atmosphere is destructive of hemp fiber. It has been suggested that in these cases the ropes should be dipped, when dry, into a bath containing twenty grammes of sulphate of copper, per liter of water, and kept in soak in this solution for four days, afterward being dried. The ropes will thus have absorbed a certain quantity of sulphate of copper, which will preserve them from the attacks of animal parasites and from rot. The copper salt may be fixed in the fiber by a coating of tar or by soapy water. For tarring the rope it is best to pass it through a bath of boiled tar, hot, drawing it through a thimble to press back the excess of tar, and suspending it afterward on a staging to dry and harden. In the second method, the rope is soaked in a solution of one hundred grammes of soap, per liter of water. The copper soap thus formed in the fiber of the rope preserves it from rot even better than the tar, which acts mechanically to imprison the sulphate of copper, which is the real preservative. It is not stated whether the copper treatment is equally serviceable with dressed as with plain hemp ropes. — *Scientific American.*

Removal of Falguieres's Model from the Arc de Triomphe, Paris.— Recent visitors to this Capital will hear without much regret that the plaster group on the top of the Arc de Triomphe is about to be taken down. It was only put up in order to enable the public to judge of the effect that a permanent structure of the same description would produce. It was at once evident that M. Falguières's group was quite out of character with the simple and somewhat severe grandeur of the famous arch and of the grand reliefs that adorn its sides, besides which the plaster was dazzlingly white by comparison with the weather-stained hue of the marble. The plaster has now become of much the same color as the arch; but alas! it is already crumbling to pieces, and there is some danger of the allegorical figure of the law falling down and crushing, in a literal sense, the promenaders beneath it.— *London Daily Telegraph.*

The Bronze Bacchus from the Tiber.— The chalky incrustation which covered the bronze statue lately found in the bed of the Tiber has been removed, and the admirable modelling of the statue has thus been fully revealed. It is one of the most beautiful works of the kind, and, with the exception of some damage to the legs and left hand, is in a capital state of preservation. The statue, about six feet high, is doubtless that of the youthful Bacchus. In the left hand is the usual staff, while the right probably held a drinking-cup, in the attitude so often seen in pictures of the god at Pompeii. The soft and feminine form, the ivy wreath on the head, the luxuriously-waving hair, which is modelled in the manner of the hair of Apollo, are other proofs that the statue was meant for Bacchus. It seems to belong to the first century of the Roman Empire, when Rome was illuminated by the last rays of Greek art. The lines and surfaces of the statue in all the uninjured parts are as fresh and pure as if the work had just left the master's hand. The figure was only half buried, head downward, in the bed of the river, so that the action of the water has roughened the lower parts. The eyes inserted are of ivory and give extraordinary vitality to the expression.— *London Daily News.*

Rumored Sale of the Dudley Collections. — If a widespread rumor in art circles may be looked upon as an accepted fact, a very important collection of pictures and other treasures will come under the hammer next season. It is no other than the contents of the treasure-house filled by the late Earl of Dudley, who, it is well known, opened his purse with a liberality quite regardless of expense wherever his gallery was concerned. Few private collections could present such varied interest both to connoisseurs and amateurs as this curious assemblage of works by ancient masters and painters of a later day. Fifteenth-century pictures of the Italian, German, and Dutch schools appealed most to the late Earl's taste, but this hobby did not stand in the way of lavish expenditure in other directions. He acquired some of the finest Turner drawings that eye has ever coveted, besides astonishing Parisian and London society by paying the sum of 3,560 guineas for a single example of Greuze, namely, "La Petite Fille au Chien," when the San Donato collection was dispersed at the Hôtel Drouot some fifteen years ago. But this was not the sole extravagance where the fascinations of Greuze were concerned. His picture called "Le Matin" cost the Earl 3,080 guineas, "L'Enfant à la Pomme" 1,240 guineas, and a less attractive picture, called "The Lover Discovered," 2,120 guineas. These were shown at the winter exhibition at Burlington House in 1870, when it may be remembered no less than 128 of the pictures exhibited were from Lord Dudley's valuable store-house. — *London World.*

Jade.— Jade has been brought to China as an article of tribute from the earliest times of which even the Celestials have any record, and so highly have they prized it that they have jealously striven to keep it entirely in their own hands. It is, however, thought possible that, as this mineral is not known to occur anywhere in Europe, the jade celts which have been found in European lake-dwellings and other prehistoric remains, have probably travelled thither as barter in the course of the great Aryan westward migration from the highlands of Central Asia. Tradition affirms that the Aryan regard the wearing of a jade ornament as the most effectual charm against lightning—a faith which would naturally account for their carrying with them many such treasures. So in Hindostan, though specimens of carved jade inlaid with rubies and diamonds were among the priceless treasures of the Mogul Emperors, there is no reason to believe that this mineral has ever been found in the Empire; and it is supposed that the raw material must have been brought from those same mines, of which there are considerably over a hundred, one great mountain side being riddled by dark tunnels, which are the entrances to long, winding galleries, excavated in every direction, and in some cases piercing right through the mountain to its further side. The jade is found in veins which are sometimes several feet in depth, but it is so full of fissures that it is rare to obtain a perfect block more than a few inches thick. Hence the great value of large pieces when found without a flaw. Such are reserved for the imperial tribute, and the Emperor himself awards such blocks to the artist who is most certain to do it justice, the natural form of the block deciding what shall be the character of the sculpture. Such an imperial commission is equivalent to a life-work, for although when first broken from its rocky bed, the jade may be scratched with an ordinary knife, it soon hardens so as to become the most difficult of minerals for the sculptor's art. Hence, such vases and other ornaments as became so familiar to us after the looting of the Summer Palace, each represented twenty or thirty years of ceaseless toil at the hands of a patient and most diligent worker. And yet I have seen some of these priceless art treasures in British homes, where their value in this respect seems undreamed of. The Chinese name of the stone is Yu-Shek, and that by which we call it is said to be a corruption of a Spanish word referring to a superstition of the Mexican Indians, who deemed that to wear a bracelet of this stone was the surest protection against all diseases of the loins, hence the Spaniards named the mineral *Piedra de hijada* (stone of the loins), by which name it became known in Europe, and ere long was contracted to its present form. Where the Mexicans obtained their specimens is not known, mineralogists having failed to discover the mineral on the American Continent. New Zealand, however, has supplied her own jade in the form of great pebbles, which with infinite labor have been wrought into those large celts and grotesque amulets which formed the most priceless possessions of the high chiefs. As a matter of course, in this daily market of the modern work produced in the jade-cutters' street, we saw no specimens of very artistic work; such can rarely come into the market; but the prices of even simple thumb rings or earrings is so great that I had to console myself by the thought that I could get much more show for my money by investing in some very pretty vases of a cheap green stone mounted in well-carved stands of polished blackwood. It really is amazing to think of the value of the goods offered for sale on those stalls of rough wooden planks! The real price—not the price asked with a view to its being beaten down in the wearisome manner in which all shopping is here conducted, but the price which a Chinese mandarin might pay for a string of really good bright green beads — might be £1,000! For two buttons suitable for his own use, he would pay £30. The most costly color is a vivid green like that of a young rice field, and for a really good specimen of this £500 or £600 is sometimes paid for a personal ornament of very moderate size.—*Belgravia.*

The American Architect and Building News. Dec. 26, 1885. No. 522.



GATE-LODGE for F. L. AMES, ESQ., NORTH EASTON, MASS.—INTERIOR VIEW.

H. H. RICHARDSON, Architect.